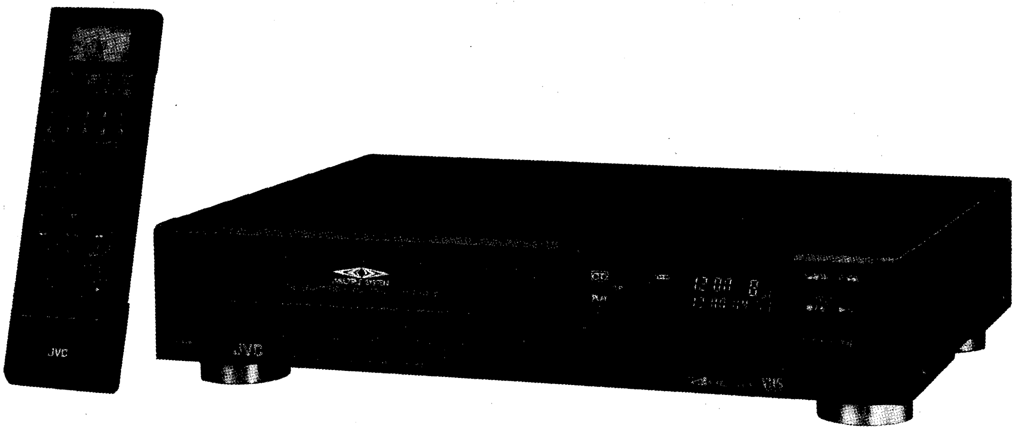
JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER VHS

HR-D637MS(E)



This Service Manual applies to sets with designation (E) shown on the Rating Label.

SPECIFICATIONS

GENERAL

Power requirement : AC 110 – 240 V∿, 50/60 Hz
Power consumption : 28 W
Temperature : 5°C to 40°C (Operating)
: –20°C to 60°C (Storage)
Operating position : Horizontal only
Dimensions (WxHxD) : 435 x 95 x 332 mm
Weight : 5.8 kg
Format : VHS standard
Tape width : 12.65 mm
Tape speed (SP) : 23.39 mm/sec (PAL/MESECAM/SECAM)
: 33.35 mm/sec (NTSC)
(LP) : 11.70 mm/sec (PAL/MESECAM/SECAM)
(EP) : 11.12 mm/sec (NTSC)
Maximum recording time (SP) : 240 min. with E-240 video cassette (PAL/MESECAM/SECAM)
: 160 min. with T-160 video cassette (NTSC)
(LP) : 480 min. with E-240 video cassette (PAL/MESECAM/SECAM)
(EP) : 480 min. with T-160 video cassette (NTSC)

VIDEO

Signal system : PAL and SECAM colour and CCIR monochrome signals, 625 lines/ 50 fields
: NTSC colour and EIA monochrome signals, 525 lines/60 fields
Recording system : Rotary two-head helical scan system with slant double-azimuth combination video heads
Input : 0.5 to 2.0 Vp-p, 75 ohms, unbalanced
Output : 1.0 Vp-p, 75 ohms, unbalanced
Signal-to-noise ratio : 43 dB (Rohde & Schwarz noise meter) with PICTURE SHARPNESS control at centre postion
Horizontal resolution : : 240 lines (PAL/SECAM), 220 lines (NTSC) with PICTURE SHARPNESS control at centre postion

AUDIO

Recording system : Longitudinal track
Input : –8 dBs, more than 50 k-ohms, unbalanced
Output : – 6 dBs, less than 1 k-ohm, unbalanced (100 k-ohms, load)
Frequency range : 70 Hz to 10,000 Hz

TUNER

Tuning system : Voltage synthesized tuner
TV channel storage capacity : 48 positions (+ AUX position "AU")
Aerial input : System B/G, D/K, I, L, M
(Europe ch) : VHF ch E2 – E4, X – S1, S2 – S10
E5 – E12, S11 – S20
UHF ch E21 – E69
(France ch) : VHF ch 2 – 4, 5 – 10
UHF ch 21 – 69
CABLE ch B – Q, 70 – 86
(USA ch) : VHF ch 2 – 6, 7 – 13
UHF ch 14 – 83
CABLE ch A-6 – A-3, A-1 – I, J – W
(JAPAN ch) : VHF ch 1 – 3, 4 – 12
UHF ch 13 – 62
Aerial output : System K, I, G, M, L modulation
PAL/SECAM : UHF 32 – 40 adjustable (preset E36 ch)
USA : UHF 29 – 39 adjustable (preset 34 ch)
JAPAN : UHF 28 – 38 adjustable (preset 33 ch)

TIMER

Clock reference : Quartz-crystal
Programme capacity : : 1-year/8-programme timer

ACCESSORIES

Provided accessories : Aerial cable,
Infrared remote control unit,
"R03/AAA/UM-4" battery x 2,
Plug adapter

Specifications shown are for SP mode unless otherwise specified.
Design and specifications subject to change without notice.

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Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▨) parts are critical for safety.
   Replace only with specified part numbers.
   Note: **Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.**

3. Fuse replacement caution notice.
   Caution for continued protection against fire hazard.
   Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors
   5) Barrier

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

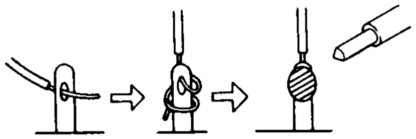


Fig. 1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10–15 kg of force in any direction will not loosen it.

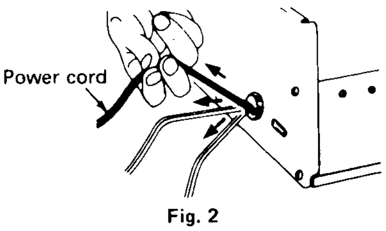


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.
    1) **Connector part number** : E03830-001
    2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
    3) **Replacement procedure**
       (1) Remove the old connector by cutting the wires at a point close to the connector.
       Important : Do not reuse a connector (discard it).

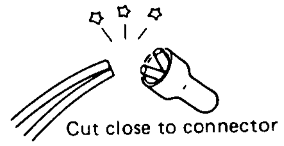


Fig. 3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

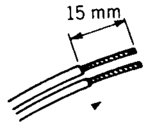


Fig. 4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

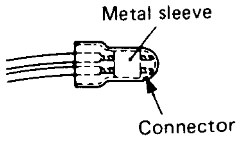


Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

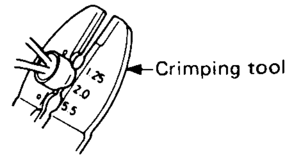


Fig. 6

(5) Check the four points noted in Fig. 7.

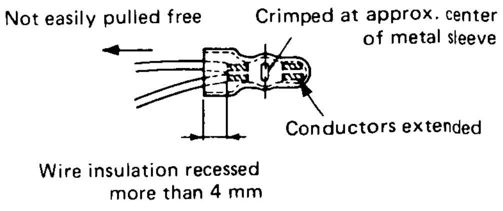

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. **Insulation resistance test**
   Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. **Dielectric strength test**
   Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. **Clearance distance**
   When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

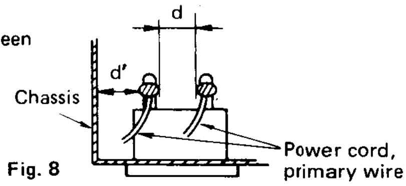


Fig. 8

4. **Leakage current test**
   Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).
   Measuring Method: (Power ON)
   Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

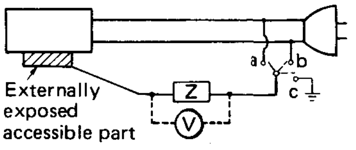


Fig. 9

5. **Grounding (Class I model only)**
   Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).
   Measuring Method:
   Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

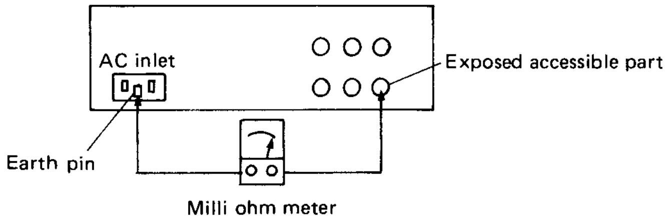


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R ≧ 1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 minute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	—	AC 900 V 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R ≧ 10 MΩ /500 V DC	AC 3 kV 1 minute (Class II) AC 1.5 kV 1 minute (Class I)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Table 1 Specifications for each region

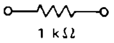
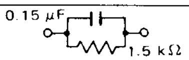
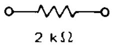
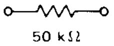
AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	 1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	 0.15 μF 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	 2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		 50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

SAFETY PRECAUTIONS

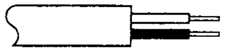
The rating plate and the safety caution are on the rear of the unit.

WARNING — DANGEROUS VOLTAGE INSIDE
WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

IMPORTANT (In the United Kingdom)
Mains Supply (240 V∿, 50 Hz only)

IMPORTANT

Do not make any connection to the Larger Terminal corded E or Green. The wires in the mains lead are coloured in accordance with the following code:



If these colours do not correspond with the terminal identifications of your plug, connect as follows:
Blue wire to terminal coded N (Neutral) or coloured Black.
Brown wire to terminal coded L (Live) or coloured Red.
If in doubt — consult a competent electrician.

CAUTION

- When you are not using the recorder for a long period of time, it is recommended that you disconnect the power cord from the AC outlet.
- Dangerous voltage inside. Refer internal servicing to qualified service personnel. To prevent electric shock or fire hazard, remove the power cord from the AC outlet prior to connecting or disconnecting any signal lead or aerial.

Omkopplaren OPERATE på denna apparat är sekundärt kopplad och skiljer inte apparaten från nätet i läge OPERATE OFF.

The OPERATE button does not completely shut off mains power from the unit, but switches operating current on and off.

BEMAERK: I stilling OFF er apparatet stadig forbundet med lysnettet Hvis det ønskes fuldstændig afbrudt skai netledningen trækkes ud.

This unit is produced to comply with Directives 76/889/EEC, 82/499/EEC, 87/308/EEC and Standard IEC Publ. 65.

POWER SYSTEM

This set operates on any voltage between 110 and 240 V, 50/60 Hz with automatic switching.
There is no switch nor control for power line adaptation.

Video tapes recorded with this video recorder in the LP (Long Play) or EP (Extended Play) mode cannot be played back on a single-speed video recorder.

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VHS PAL SECAM NTSC HQ

- *Only cassettes marked "VHS" can be used with this video recorder.*
- HQ VHS is compatible with existing VHS equipment.

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PRECAUTIONS

Handling and storage

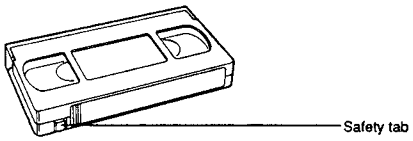
- Avoid using the recorder under the following conditions:
  - extremely hot, cold or humid places,
  - dusty places,
  - near appliances generating strong magnetic fields,
  - places subject to vibrations, and
  - poorly ventilated places.
- Be careful of moisture condensation.
- Avoid using the recorder immediately after moving from a cold place to a warm place. The water vapour in warm air will condense on the still-cold video head drum and tape guides and may cause damage to the tape and the recorder.
- Handle the recorder carefully
  - Do not block the ventilation openings.
  - Do not place anything heavy on the recorder.
  - Do not place anything which might spill and cause trouble on the top cover of the recorder.
  - Use in horizontal (flat) position only.
- In case of transportation,
  - Avoid violent shocks to the recorder during packing and transportation.
  - Before packing, be sure to remove the cassette from the recorder.

Video cassettes

- This recorder employs VHS-type cassettes only.

Cassettes	Recording time	Recording system
E-240	240/480 minutes	PAL/SECAM/MESECAM
E-180	180/360 minutes	PAL/SECAM/MESECAM
E-120	120/240 minutes	PAL/SECAM/MESECAM
E-90	90/180 minutes	PAL/SECAM/MESECAM
E-60	60/120 minutes	PAL/SECAM/MESECAM
E-30	30/60 minutes	PAL/SECAM/MESECAM
T-160	160/480 minutes	NTSC
T-120	120/360 minutes	NTSC
T-90	90/270 minutes	NTSC
T-60	60/180 minutes	NTSC
T-30	30/90 minutes	NTSC

- Video cassettes are equipped with a safety tab to prevent accidental erasure. When the tab is removed, recording cannot be performed. If you wish to record on a cassette whose tab has already been removed, use adhesive tape to block the hole.



- Avoid exposing the cassettes to direct sunlight. Keep them away from heaters.
- Avoid extreme humidity, violent vibrations or shocks, strong magnetic fields (near a motor, transformer or magnet) and dusty places.
- Place the cassettes in cassette cases and position vertically.

Moisture condensation

- If you pour a cold liquid into a glass, water vapour in the air will condense on the surface of the glass. This is called moisture condensation.
- Moisture condensation on the head drum, one of the most crucial parts of the video recorder, will cause damage to the tape.
- Moisture condensation is apt to occur under the following conditions:
  - when the recorder is moved from a cold place to a warm place, and
  - under extremely humid conditions.
- In conditions where moisture condensation may occur, keep the power cord plugged in an AC outlet and the power switched on; this will help prevent condensation from occurring. When condensation has occurred, it will not evaporate quickly once the power is switched on. Wait a few hours for the recorder to become dry.

Operation

- When a cassette is loaded, the power is switched on automatically.
- The cassette can be unloaded even when the power is off. Pressing the ■/⏏ button turns the power on and, after ejection of the cassette, shuts it off automatically in this case.
- As long as the TIMER button is engaged with the TIMER indicator lit, the OPERATE and ■/⏏ buttons have no effect and unloading of a cassette is not possible. If a cassette has not yet been inserted, simply insert a cassette; the power will be switched on to load the cassette properly and, after completion of automatic loading, the Timer Recording Standby mode will be engaged with power off.

Remote control unit

- Avoid violent shocks, especially take care not to drop the unit.
- Take care not to allow liquid to spill into the unit.
- Do not place heavy objects on the unit.
- Avoid leaving the unit in places subject to direct sunlight or extremely high temperatures.

IMPORTANT: It may be unlawful to record or play back copyrighted material without the consent of the copyright owner.

FEATURES

Multi-system flexibility

- ***PAL/MESECAM/SECAM//NTSC 3.58/NTSC 4.43*** *five-*system recording and playback circuitry incorporated to adapt to television colour systems the world over.
- **Worldwide-compatible multi-system tuner (B/G, I, D/K, L, M)** built in to directly receive off-air TV programmes in most countries.
- **Multi-system RF converter (G, I, K, L, M) for UHF channels** built in to provide greater compatibility with televisions.
- **Multi-voltage operation with automatic switching (110 – 240 V AC).**

High-quality pictures

- **HQ (High Quality) System technologies** with DE (Detail Enhancer), and WCL (20 % higher white clip level).
- **Double-Azimuth 4-head (DA-4) system** for quality recording and playback at both recording speeds.
- **Long 8-hour recording time** in the LP (Long Play) mode for PAL/SECAM/MESECAM recording or EP (Extended Play) mode for NTSC recording.
- **Digital Tracking** for constantly maintaining the best possible tracking: provides optimum pictures from most recorded tapes. Especially useful with rental software. Manual override is also possible.
- Picture sharpness control.

Special-effects playback

- **Noiseless field stills and variable-speed slow motion** available with PAL/SECAM/MESECAM SP mode recordings.
- **Variable-speed search** in both directions.
- **Double-speed forward playback and normal-speed reverse playback.**

Remote control features

- **Independent timer programming** with built-in LCD and 4 programme memories.
- **Direct access to VCR's timer programmes** for checking and cancelling.
- **Built-in clock,** tape eject and Index Mark/Erase controls.
- **10-Digit keypad** for timer programming, channel selection, Index Search, Go-To, and Time Search functions.
- **TV control** for power on/off, volume, channel and AV mode selection (designated JVC TV's only).
- **Duet Editing system:** a single remote control command controls two JVC decks simultaneously — one for playback and one for recording — for simplified editing operation.
- **Instant A/B code switching** with indicator on LCD for controlling two JVC decks independently from a single remote control.

Tuner features

- **Voltage synthesized VHF/UHF/CATV tuner** with 48-channel storage capacity.
- **10-key random-access remote channel selection** and up/down channel scanning.

Timer features

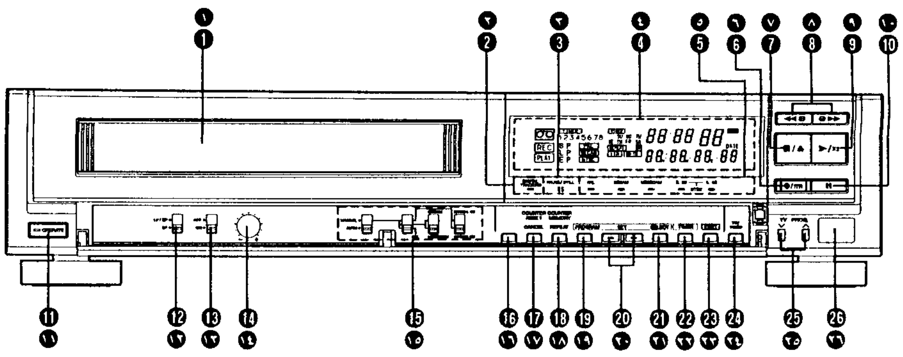
- **1-Year/8-event programmable timer.**
- **24-Hour instant timer** for quick setting to record a programme which starts within 24 hours.
- One-button instant timer recording.
- **Instant "summer time" adjustment** for making annual clock adjustment to or from daylight saving time a single-touch operation.

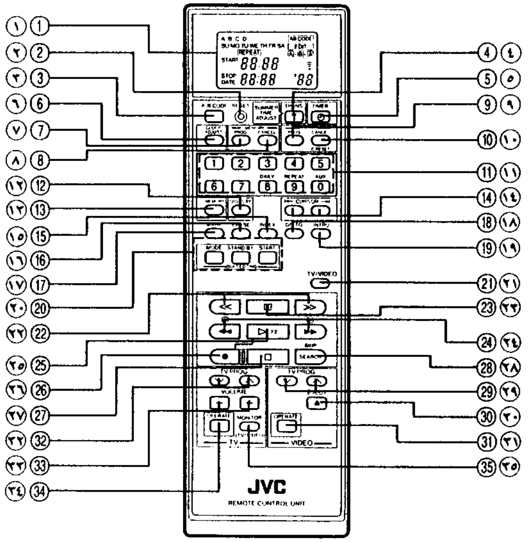
Tape access features

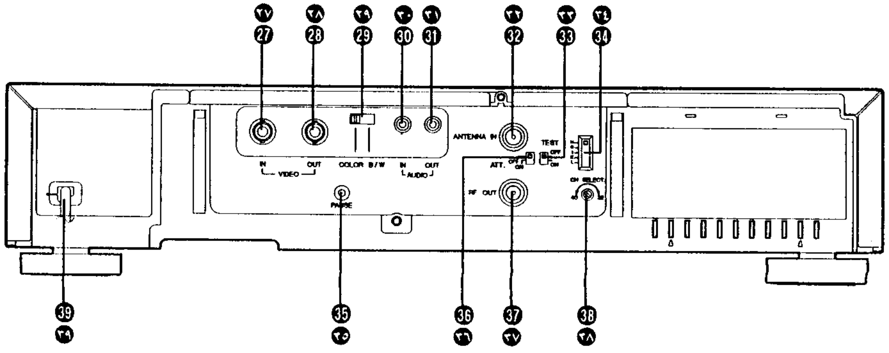
- **VHS Index Search System** which automatically places index codes at the beginning of any recording, with **mark/erase facilities** for manual marking of extra codes, or erasing of unnecessary codes.
- **Automatic location of up to 99 coded programmes** by remote-specifying the number of index codes to be skipped.
- **Intro Search** to play back the beginning of each indexed programme for about 5 seconds in fast-motion.
- **Realtime Go-To function** for locating a point on tape a specified time away from the beginning.
- **Realtime Search function** for locating a point on tape a specified time away from the current position in either direction.
- **Half-loading mechanism for quick tape access:** Index and Intro Search, and Realtime Go-To and Search can all be carried out in the REW and FF modes as well as in the Shuttle Search mode.
- Counter memory function for returning to a designated point on tape.
- Shuttle Search with lock function at 9 times (PAL/SECAM/MESECAM) or 7 times (NTSC) normal speed.

Other value features

- **Realtime tape counter** showing tape time in hours, minutes and seconds by counting the recorded control signal pulses.
- **Child Lock system** for making the recorder's operation buttons ineffective; preventing accidental operation by young children, or other unwanted operation.
- **Automatic backspace editing by Zero Frame Editing system** for clean assemble edits.
- **Automatic functions** including Auto Play, Next-Function Memory, and more.
- **On-screen record-pause mode display** showing elapsed pause time.
- Pause remote control connector for VideoMovie's Master Edit Control system.







CONTROLS, INDICATORS AND CONNECTORS

Refer to diagrams on the front foldout page.

Front Panel

❶ **Cassette loading slot**

Insert a VHS cassette. The door will close and the "cassette loaded" indicator will appear on the FDP (fluorescent display panel).

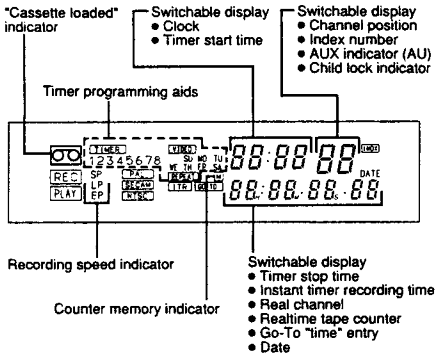
❷ **DIGITAL TRACKING indicator**

Lights in the Digital Tracking mode.
Blinks when adjusting.

❸ **PAUSE/STILL indicator**

- Pause mode: Lights together with the REC indicator on the FDP.
- Still mode: Lights together with the PLAY indicator on the FDP.

❹ **Fluorescent Display Panel (FDP)**



❺ **Colour system indicators**

These indicators show the selected colour system according to the detected input signal or the settings of the colour system select switches ⓯. For more details refer to pages 9 through 12.

❻ **Record/Instant Timer Record button (●/ITR)**

- Press once to start recording.
- Press twice to engage the Instant Timer Recording mode.

❼ **Stop/Eject button (■/⏏)**

- Press while in the Stop mode to eject the cassette.
- Press while in other modes to stop the tape.

❽ **Rewind/Fast-Forward/Shuttle Search buttons (◀◀/▶▶)**

- Press while in the Stop mode to rewind or fast-forward the tape.
- Press while in the Play mode for Shuttle Search in the reverse or forward direction.

❾ **Play button (▶/X2)**

- Press once to play back a tape.
- Press again for double-speed playback.
- Also press to cancel the Pause/Still, Shuttle Search or Double-Speed mode.

❿ **Pause/Still button (❚❚)**

- Press while in the Record mode to stop the tape temporarily to avoid recording of unwanted material.
- Press while in the Play mode to view a still picture.
- The still picture can be advanced each time this button is pressed.

⓫ **OPERATE button with LED indicator**

Press to apply operating power to the recorder. The LED indicator will light. Loading a cassette also turns the power on.

⓬ **TAPE SPEED switch**

SP: Set to this position when you wish recordings to be made in the SP (Standard Play) mode for all systems.

LP/EP (NTSC): Set to this position when you wish to record longer TV shows or for unattended and prolonged recording of a number of TV shows with a combined time of up to 8 hours. In PAL/SECAM/MESECAM, the LP (Long Play) mode will be engaged; in NTSC, the EP (Extended Play) mode will be engaged.

⓭ **AFC switch**

Normally set to ON.

⓮ **PICTURE SHARPNESS control**

Turn this knob clockwise to make the picture sharper. Turn counterclockwise to give the picture a softer tone. Effective only for playback pictures. (No effect for recording.)

⓯ **Colour system select switches**

- **AUTO/MANUAL switch**
  A master switch for selecting the television colour system. First set this switch to either AUTO or MANUAL depending on the required mode. When the MANUAL mode is selected, set the other system select switches manually as required. For more details refer to page 12.
- **MANUAL select switch**
  Use this switch to manually select the appropriate system when the AUTO/MANUAL switch is set to MANUAL. For more details refer to page 12.
- **MESECAM/SECAM switch**
  Use this switch to select the appropriate system. This switch must be set correctly even in the AUTO mode. For more details refer to page 12.
- **NTSC 3.58/4.43 switch**
  Use this switch to select the appropriate system. This switch must be set correctly even in the AUTO mode. For more details refer to page 12.

⓰ **CH. SET button**

Press to engage the Channel Set mode.

⓱ **COUNTER RESET/CANCEL/SKIP button**

This is a triple-function button:

- as a COUNTER RESET button — press to reset the realtime counter reading to "0H 00M 00S".
- as a CANCEL button — press to cancel the programmed data in the Timer Set mode.
- as a SKIP button — press to skip unnecessary channels in the Channel Set mode.

⓲ **COUNTER MEMORY/REPEAT/STORE button**

This is a triple-function button:

- as a COUNTER MEMORY button — press to engage the Counter Memory mode, "M" will appear on the FDP and the tape will stop automatically at the counter reading of "0H 00M 00S" when rewinding or fast-forwarding.
- as a REPEAT button — press to enter the repeat command in the Timer Set mode.
- as a STORE button — press to store the tuned-in channel in the Channel Set mode.

⓳ **PROGRAM/CLOCK ADJUST button**

Press to change the recorder's mode in the following order: Clock mode, Timer Set mode, Clock Set mode, then return to the Clock mode.

⓴ **SET/TRACKING/V. LOCK/CH. SEARCH/FINE tuning buttons (–/+)**

These are quadruple-function buttons:

- as SET buttons — press to set the correct data in the Clock Set or Timer Set mode.
- as TRACKING/V. LOCK buttons — press to minimize noise bars, if observed, during playback (for automatic digital tracking information, refer to page 17) or press to eliminate vertical vibration of the picture, if observed, in the Still mode.
- as CH. SEARCH buttons — press to initiate automatic scanning.
- as FINE tuning buttons — press to shift the frequency in either direction to fine-tune in a specific station in the Channel Set mode.

㉑ **SELECT/SUMMER TIME ADJUST button**

This is a dual-function button:

- as a SELECT button — press to select the item to be set in the Clock Set, Channel Set or Timer Set mode.
- as a SUMMER TIME ADJUST button — press and quickly release to advance the clock by one hour, hold it pressed for 2 seconds to set the clock back by one hour (see page 13).

㉒ **TIMER button**

Press to engage the Timer Standby mode.

㉓ **START button**

Press to engage the 24-Hour Instant Timer Set mode. (See page 20.)

㉔ **TV/VIDEO button**

Selects between TV and VIDEO modes.

- TV mode (the VIDEO indicator on the FDP is off): for TV viewing and for watching a TV programme while recording another.
- VIDEO mode ("VIDEO" appears on the FDP): for recording a TV programme while watching it and for playing back recorded tapes. When the power is switched on, the TV mode is engaged initially.To change the mode, press this button.

㉕ **TV PROG. ∨/∧ buttons**

Press either button to scan to a desired channel.

㉖ **Infrared beam receiving window**

Rear Panel

㉗ **VIDEO IN connector**

Connect the video output of other video equipment such as another video tape recorder for recording video signals.

㉘ **VIDEO OUT connector**

Video signals being recorded or played back are available from this connector.

㉙ **Video mode select switch**

This applies to both recording and playback.

COLOR: Set to this position when the input or playback video signal is in colour.

B/W: Set to this position when the input or playback video signal is monochrome.

㉚ **AUDIO IN connector**

Connect an audio tape recorder, other audio sources or another video recorder for recording sound.

㉛ **AUDIO OUT connector**

Audio signals can be obtained from this connector.

㉜ **Aerial input connector (ANTENNA IN)**

Connect an aerial to this connector.

㉝ **TEST signal switch**

Set to ON when tuning your TV receiver for the VIDEO CHANNEL. A test signal in the form of two vertical white bars will be available.

㉞ **SYSTEM select switch**

Selects the system of the built-in RF converter.
Select K, I, G, M or L depending on the system of your television receiver.
This switch is preset G prior to shipment.

㉟ **Remote PAUSE terminal**

When using a JVC video camera, connect the remote control cable of the camera adapter to this terminal for the purpose of controlling the starting and stopping of the tape with the camera's start/stop switch. When used with a JVC VideoMovie equipped with the Master Edit Control system, this terminal makes quality editing simple.

㊱ **Attenuator switch (ATT.)**

Set to OFF to receive broadcasts from distant stations.
Set to ON to receive broadcasts of high field strength.

㊲ **RF OUT connector**

Connect to the aerial connector of a TV receiver through the aerial cable (provided).

㊳ **RF converter frequency adjustment screw (CH. SELECT)**

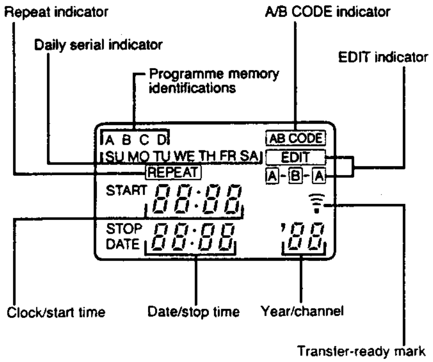
See page 8.

㊴ **Power cord**

Remote Control Unit

① **LCD (Liquid Crystal Display) panel**

Refer to this panel when programming the remote control's built-in timer memory.



②**RESET button**
Insert a pointed object into the hole to press the initialize button inside, when required. The memory for the LCD display will be cleared.
Normally do not touch this button.

③ **A/B CODE button**
When using two JVC video decks, press to switch this remote control from the "A" mode to "B" mode, or vice versa, depending on the deck to be controlled. (See pages 7 and 26.)

④ **TRANS/SUMMER TIME ADJUST button**
This is a dual-function button.
- as a TRANS button — press to transfer the data held in the remote control's timer memory to the recorder.
- as a SUMMER TIME ADJUST button — press to adjust the remote control's clock to the summer time setting. (See page 14.)

⑤ **TIMER button**
Functions same as ㉒.

⑥ **CLOCK ADJUST button**
Press to adjust the clock of the remote control.

⑦ **MEMORY PROG. button**
Press to programme the remote control's timer memory.

⑧ **MEMORY CANCEL button**
Press to cancel the programmed data in the remote control's timer memory.

⑨ **VTR PROG. button**
Press to engage the recorder's Timer Set mode.

⑩ **VTR CANCEL/C. RESET button**
This is a dual-function button.
- as a VTR CANCEL button — press to cancel the programmed data held in the recorder's timer memory in the Timer Set mode.
- as a C. RESET button — press to reset the realtime counter reading to "0H 00M 00S".

⑪ **Multi-purpose numeric keys**
Clock setting: See page 14.
Channel selection: See page 15.
Timer Programming: See page 24.
Realtime Go-To and Search functions: See page 22.
Index Search: See page 21.
External Source recording: See page 25.

⑫ **DISPLAY button**
Press to switch the display among the realtime tape counter and date.
Also press to change the display from the Timer Set mode to the Clock mode.

⑬ **C. MEMORY button**
Functions same as ⓲ as a COUNTER MEMORY button.

⑭ **CURSOR (⇤/⇥) buttons**
When setting the timer, use these buttons to move the cursor to the position for data entry.

⑮ **INDEX button**
Press to engage the Index Search mode. (See page 21.)

⑯ **ERASE button**
Press during playback to erase an index code. (See page 21.)

⑰ **MARK button**
Press during playback or recording to put an index code onto the tape. (See page 21.)

⑱ **GO-TO button**
Press to engage the Realtime Go-To mode. (See page 22.)

⑲ **INTRO button**
Press to engage the Intro Search mode. (See page 21.)

⑳ **DUET EDITING MODE, STAND-BY and START buttons**
Duet Editing controls for simultaneous control of two JVC decks in editing. (See page 26.)

㉑ **TV/VIDEO button**
Functions same as ㉔.

㉒ **<</>> (Variable search) button**
Press either button to search for a specific segment of the programme at variable speeds. (For details, see page 18.)

㉓ **⏸ (Pause/Still) button**

㉔ **◀◀/▶▶ (Rewind)(Fast-Forward)(Shuttle Search) buttons**

㉕ **▷/X2 (Play/X2) button**

㉖ **● (Record) button**
Press together with the ▷/X2 button ㉕ to start recording.

㉗ **□ (Stop) button**

㉘ **SKIP SEARCH button**
Press while in the Play mode to skip through unwanted tape segments. (See page 18.)

㉙ **TV PROG. buttons (∨/∧)**
Function same as ㉕.

㉚ **EJECT button**
Press while in the Stop mode to eject the cassette.

㉛ **OPERATE button**
Press to turn the recorder power ON or OFF.
Keep this button pressed for 2 seconds when turning the power off to engage the Child Lock mode. (See page 16.)

TV Operation buttons (designated TV models only)

㉜ **TV PROG. buttons (∨/∧)**
Press to select a desired channel on the TV receiver.

㉝ **VOLUME buttons (– / +)**
Press to decrease or increase the TV's sound volume.

㉞ **OPERATE button**
Press to turn the TV power on or off.

㉟ **MONITOR (TV/VIDEO) button**
Press to select the TV's operating mode.
TV: For viewing broadcast programmes or tape programmes via RF OUT connection.
VIDEO: For viewing programmes via the AV connection.

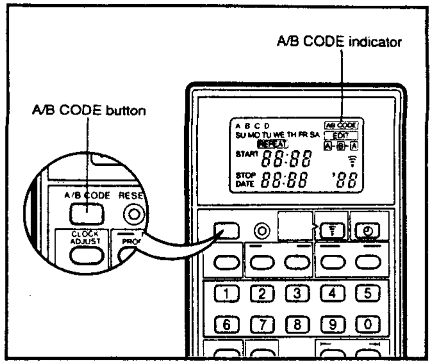
Remote Control Unit

A/B code switching

When you own two JVC video decks, this remote control can operate both decks separately; they do not respond simultaneously to the remote control's signal, if they are set to respond to different codes. Initially this recorder is set in the "A" mode.
To change the mode, carefully follow the instructions below:

(1) Unplug the power cord of the recorder from the AC outlet.
(2) Press the A/B CODE select button to engage the "B" mode; "B CODE" will appear on the LCD.
(3) Plug the power cord of the recorder into the AC outlet.
(4) Turn on the power of the recorder using the remote control's OPERATE ㉛ button.

The recorder "memorizes" this B code and will respond only to the B code signals. Set the other deck to respond to the A code signals in the same procedure.

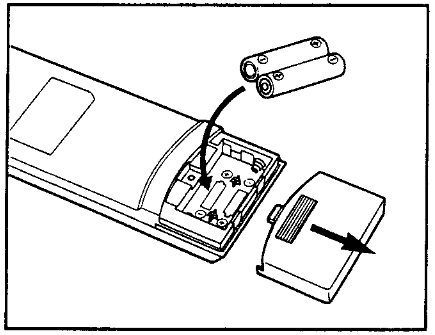


Note:
Do not operate other remote controls after you have plugged the recorder into the AC outlet and before you press the OPERATE button of this remote control.

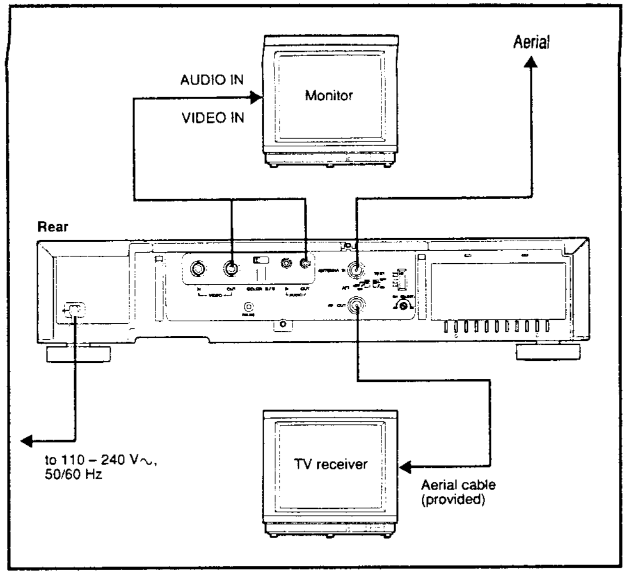
CAUTION:
Some televisions may malfunction in response to this remote control when used in the "B" mode. If this should happen, switch the mode back to "A".

Operating distance for remote control unit
- The maximum operating distance is about 8 m.

Installing the batteries
- Insert two "R03/AAA/UM-4"-size batteries (provided) into the battery compartment on the rear of the remote control unit, observing correct polarity.

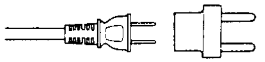


CONNECTIONS



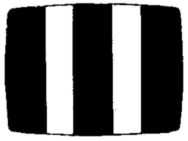
1. Remove the aerial cable from the TV receiver and reconnect it to the recorder's ANTENNA IN connector. The recorder is then ready to record off-air programmes.
2. Connect the recorder's RF OUT connector to the TV receiver's aerial terminal using the provided aerial cable. The TV receiver is then ready to receive broadcast programmes as well as accommodate video cassette playback.
3. When you use a video monitor for playback, connect the VIDEO OUT and AUDIO OUT connectors of the recorder to the VIDEO IN and AUDIO IN connectors of the video monitor.

- Use the plug adapter depending on the type of your AC wall outlet.



VIDEO CHANNEL SETTING

1. Press the OPERATE button ⓫ to turn the power on. Turn on the TV receiver.
2. Press the TV/VIDEO button ㉔ to engage the VIDEO mode. ("VIDEO" appears on the FDP.)
3. Set the TEST switch ㉝ to ON.
4. Adjust your TV receiver in the vicinity of UHF channel E36* until you bring in the two white signal bars on the screen as illustrated. This is your VIDEO CHANNEL.
   *UHF channel 34 in USA
   *UHF channel 33 in Japan.
5. Reset the TEST switch to OFF.



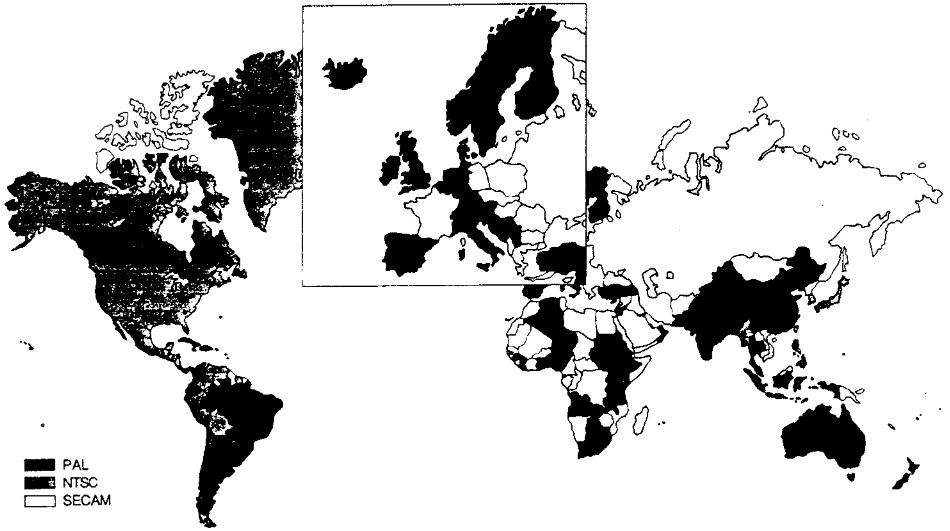
Notes:

- If some interference noise is seen on the screen because of broadcasts on neighbouring channels or if your preset broadcasts should be affected in picture quality, it is necessary to shift the RF converter output frequency from that of channel E36. Consult your JVC dealer for making this adjustment.
- Video channel setting is also possible using a prerecorded VHS video cassette. Play back the tape and tune the TV receiver to obtain clear pictures and sound while monitoring the playback picture on the TV screen.
- If your TV receiver is not provided with an AFC circuit, perform fine tuning of the TV receiver when you are actually viewing video cassettes.

IMPORTANT INFORMATION ON COLOUR SYSTEM SELECTION

WORLD'S COLOUR TV BROADCASTING SYSTEMS

This recorder incorporates the circuitry necessary to record or play back PAL, SECAM and NTSC signals from any television broadcasting system in the world.



Multi-system compatibility

Colour System	PAL			SECAM			NTSC	
Broadcasting System	B/G	D/K	I	B/G	D/K	L	M	–
Recording & Reception System	PAL	PAL	PAL	SECAM/ MESECAM	SECAM/ MESECAM	SECAM	NTSC 3.58	NTSC 4.43*
Major Countries	West Germany, Austria, Italy, Kuwait, U.A.E., Singapore, Malaysia, India, Australia	China, Mongolia	United Kingdom, Hong Kong	Saudi Arabia, Lebanon, Iran, Iraq, Egypt, Morocco, Greece, G.D.R.	Ivory Coast, U.S.S.R., Bulgaria, Czechoslovakia, Poland, Rumania	France	U.S.A., Canada, Japan, Philippines, Mexico	

*In the case of NTSC 4.43 recordings, only tape-to-tape dubbing, by using a video cassette recorder capable of playing back NTSC 4.43 recordings, is possible.

To select the right colour system, there are four switches on this recorder:

AUTO/MANUAL switch: A master switch to select the automatic or manual setting mode. In most cases, when this switch is set to AUTO, the appropriate system will be selected according to the input or playback signal, provided that the relevant sub switch is set correctly for MESECAM/SECAM recording or NTSC playback.

MANUAL select switch: To select the appropriate system in the MANUAL mode.

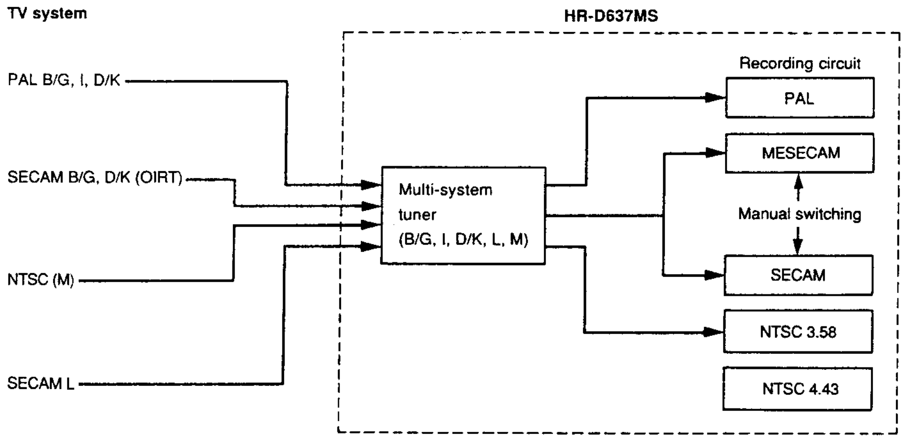
MESECAM/SECAM switch: A sub switch to select the type of resulting recorded tape as required. When recording, this switch must be set correctly in both the AUTO and MANUAL modes.

NTSC 3.58/NTSC4.43 switch: A sub switch to select the type of monitor on which NTSC tapes are to be viewed. During playback this switch must be correctly in both the AUTO and MANUAL modes.

For the settings of these colour system select switches, refer to the chart on page 12.

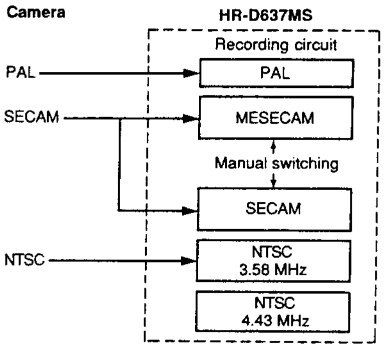
OFF-AIR RECORDING

The built-in multi-system tuner is capable of receiving PAL B/G, I and D/K, SECAM B/G, L and D/K, and NTSC broadcasts.


TV system
HR-D637MS
PAL B/G, I, D/K
SECAM B/G, D/K (OIRT)
NTSC (M)
SECAM L
Multi-system tuner (B/G, I, D/K, L, M)
Recording circuit
PAL
MESECAM
Manual switching
SECAM
NTSC 3.58
NTSC 4.43

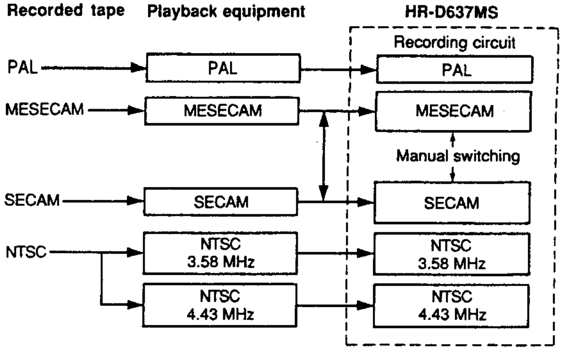
CAMERA RECORDING

Video cameras are built to one of the three standards; PAL, SECAM or NTSC. Any camera can be used with this recorder.


Camera
HR-D637MS
Recording circuit
PAL
SECAM
NTSC
PAL
MESECAM
Manual switching
SECAM
NTSC 3.58 MHz
NTSC 4.43 MHz

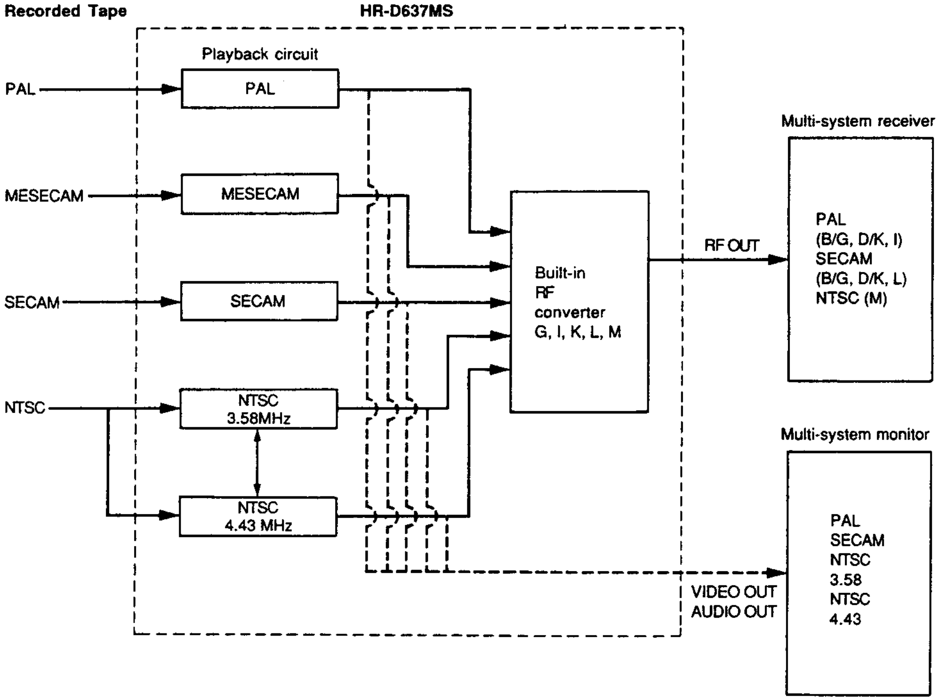
TAPE-TO-TAPE TRANSFER

There are 4 different types of recorded tape, depending on the signal recorded.


Recorded tape
Playback equipment
HR-D637MS
Recording circuit
PAL
MESECAM
SECAM
NTSC
PAL
MESECAM
SECAM
NTSC 3.58 MHz
NTSC 4.43 MHz
PAL
MESECAM
Manual switching
SECAM
NTSC 3.58 MHz
NTSC 4.43 MHz

PLAYBACK

This recorder can play back all 4 types of recorded tape.


Recorded Tape
HR-D637MS
Playback circuit
PAL
MESECAM
SECAM
NTSC
PAL
MESECAM
SECAM
NTSC 3.58MHz
NTSC 4.43 MHz
Built-in RF converter G, I, K, L, M
RF OUT
VIDEO OUT
AUDIO OUT
Multi-system receiver
PAL (B/G, D/K, I) SECAM (B/G, D/K, L) NTSC (M)
Multi-system monitor
PAL SECAM NTSC 3.58 NTSC 4.43

CAUTION

When this recorder is connected to a multi-system television set, it may happen that no colours appear on the screen if the colour system select switch of the television set is adjusted to the AUTO position. In such a case, change the setting of the colour system select switch of the television set to the position which corresponds to the setting (G, I, K, L or M) of the RF converter system select switch on the rear panel of the recorder.

SYSTEM SELECT SWITCH SETTINGS & INDICATORS

Off-air recording

TV Broadcast System	Position of System select switches				Indicator	Recorded signal on the tape
	AUTO/MANUAL select switch	MANUAL select switch	MESECAM/SECAM select switch	NTSC 3.58/4.43 select switch		
PAL	AUTO	–	–	–	PAL	PAL
	MANUAL	PAL				
SECAM	AUTO	–	MESECAM	–	MESECAM	MESECAM
			SECAM		SECAM	SECAM
	MANUAL	MESECAM/SECAM	MESECAM	–	MESECAM	MESECAM
			SECAM		SECAM	SECAM
NTSC	AUTO	–	–	–	NTSC 3.58	NTSC
	MANUAL	NTSC				

Camera recording

System	Position of System select switches				Indicator	Recorded signal on the tape
	AUTO/MANUAL select switch	MANUAL select switch	MESECAM/SECAM select switch	NTSC 3.58/4.43 select switch		
PAL	AUTO	–	–	–	PAL	PAL
	MANUAL	PAL				
SECAM	AUTO	–	MESECAM	–	MESECAM	MESECAM
			SECAM		SECAM	SECAM
	MANUAL	MESECAM/SECAM	MESECAM	–	MESECAM	MESECAM
			SECAM		SECAM	SECAM
NTSC	AUTO	–	–	–	NTSC 3.58	NTSC
	MANUAL	NTSC				

Tape-to-tape transfer

Playback equipment	Position of System select switches				Indicator	Recorded signal on the tape
	AUTO/MANUAL select switch	MANUAL select switch	MESECAM/SECAM select switch	NTSC 3.58/4.43 select switch		
PAL	AUTO	–	–	–	PAL	PAL
	MANUAL	PAL				
MESECAM	AUTO	–	MESECAM	–	MESECAM	MESECAM
	MANUAL	MESECAM/SECAM	MESECAM/SECAM		MESECAM/SECAM	MESECAM/SECAM
SECAM	AUTO	–	SECAM	–	SECAM	SECAM
	MANUAL	MESECAM/SECAM	MESECAM/SECAM		MESECAM/SECAM	MESECAM/SECAM
NTSC 3.58	AUTO	–	–	–	NTSC 3.58	NTSC 3.58
	MANUAL	NTSC				
NTSC 4.43	AUTO	–	–	–	NTSC 4.43	NTSC 4.43
	MANUAL	NTSC				

Playback

Recorded signal on the tape	Position of System select switches				Indicator	Playback signal
	AUTO/MANUAL select switch	MANUAL select switch	MESECAM/SECAM select switch	NTSC 3.58/4.43 select switch		
PAL	AUTO	–	–	–	PAL	PAL
	MANUAL	PAL				
MESECAM	AUTO	–	–	–	MESECAM	MESECAM
	MANUAL	MESECAM/SECAM				
SECAM	AUTO	–	–	–	SECAM	SECAM
	MANUAL	MESECAM/SECAM				
NTSC 3.58	AUTO	–	–	3.58	NTSC 3.58	NTSC 3.58
	MANUAL	NTSC				
NTSC 4.43	AUTO	–	–	4.43	NTSC 4.43	NTSC 4.43
	MANUAL	NTSC				

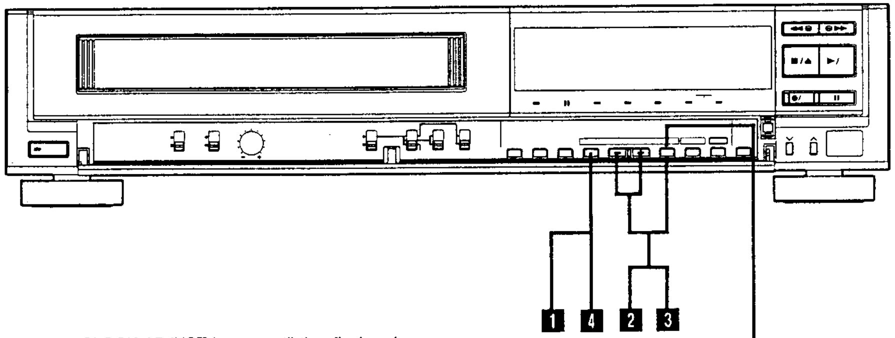
Note:

- With (CCIR) B/W signal input, or when a (CCIR) B/W tape is played back in the AUTO mode, the PAL indicator will light. The NTSC *4.43 indicator will light when EIA B/W signals are being input, and either the NTSC 3.58 or 4.43 indicator will light, depending on* the setting of the NTSC 3.58/4.43 switch, during playback of EIA B/W tapes.

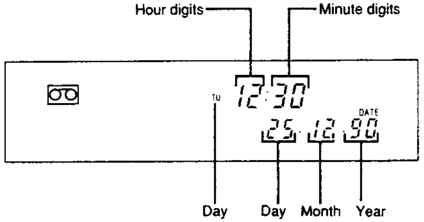
CLOCK SETTING

Setting the built-in clock

Plug the recorder into an AC outlet. The display shows a blinking 0:00.



1. Press the CLOCK ADJUST button until the display shows the Clock Set mode with the hour indication blinking.
2. Set the hour and minute in that order by using the SELECT and SET buttons alternately.
   - The blinking position is ready for entry.
   - Press SET until the correct indication appears in eachposition.
3. Set the day, month and year in the same way.
   - In year setting, set only the last two digits of the year.
4. Press CLOCK ADJUST.
   - Press it at the exact instant of the time signal, and the clock will be set accurately to the present time.
   - The day-of-the-week indication will be displayed automatically.



Notes:

- Clock setting is not possible in the timer recording standby mode. First check to see that the TIMER indicator on the FDP is not lit.
- Enter the data within 10 seconds after pressing the CLOCK ADJUST button.

SUMMER TIME ADJUST

This convenient feature is for quickly making the annual clock adjustment to the "summer time" (daylight saving time) setting, and back to regular time later.

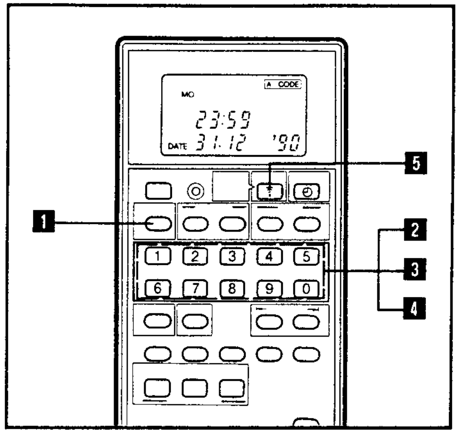
1. Simply press and quickly release the SUMMER TIME ADJUST button in the Clock Set mode to set the clock forward by one hour.
2. Later in the year, to switch back to regular time, simply hold the SUMMER TIME ADJUST button pressed for 2 seconds to set the clock back by an hour.

Power failure indicator

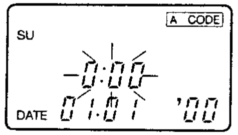
The blinking 0:00 (initial condition of the display) is also a power failure indicator, showing that there has been a power failure in excess of 3 minutes. Readjusting the time restores the normal condition of the clock display.

Setting the LCD clock of the remote control unit

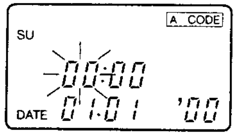
The LCD clock is independent of the recorder's clock.
The recorder's clock can be adjusted from the remote control unit if its transfer function is used.



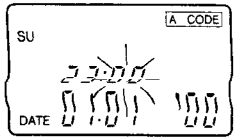
Insert two "R03/AAA/UM/4"-size batteries (provided) into the remote control. The LCD shows the following with "0:00" blinking.



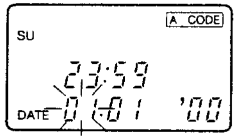
1 Press the CLOCK ADJUST button.
- The hour indication will blink.



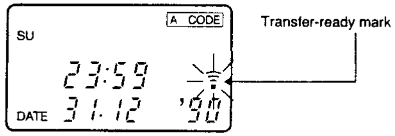
2 Press the numeric key corresponding to the current hour, then the minute indication will blink.
- Always key in two digits.
  For a one-digit number, key in "0" first.



3 *Key in the digits corresponding to the current minute, then* the day position of the DATE indication will blink.



4 Key in the digits for the day, month and year in succession.
- In year setting, set only the last two digits of the year.
- After setting the year, the transfer-ready mark will appear and blink.



5 Press the TRANS button at the exact instant of the time signal.
- The day-of-the-week indication will be displayed automatically.
- The clock of the remote control will be set accurately to the second and, at the same time the set data will be transferred to the clock of the recorder.
- When it is not necessary to transfer the clock data to the recorder, press the CLOCK ADJUST button instead of the TRANS button to set the remote control's clock.
- If the transfer-ready mark disappears before transmission, press the CLOCK ADJUST button to make it reappear, then press the TRANS button while the transfer-ready mark is blinking; otherwise, the TRANS button will function as a summer time adjust button.
- If the clock has already been set, the transfer-ready mark starts blinking when the CLOCK ADJUST button is pressed.
- To transfer the data to the recorder's clock, simply press the TRANS button.
- To readjust the clock, press the CLOCK ADJUST button and then press either CURSOR ⊢/⊣ button so that the position which requires correction blinks.

SUMMER TIME ADJUST

For quickly making the annual clock adjustment to the "summer time" (daylight saving time) setting, and back to regular time later, use the SUMMER TIME ADJUST button ④.

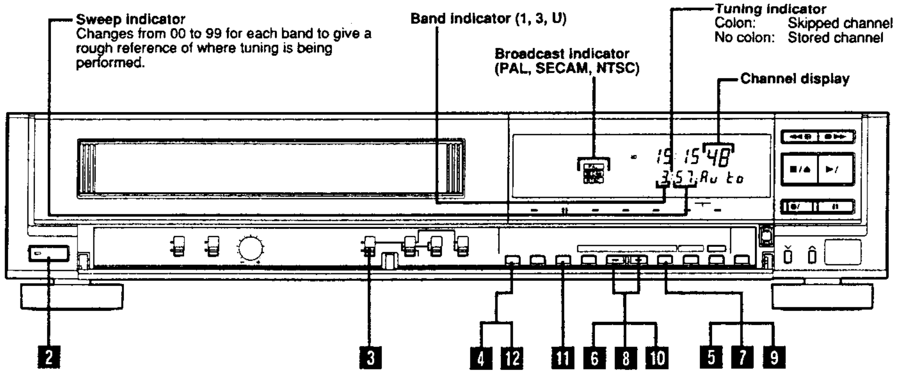
1. Simply press and quickly release the SUMMER TIME ADJUST button in the Clock mode to set the clock forward by one hour.
2. Later in the year, to switch back to regular time, simply hold the SUMMER TIME ADJUST button pressed for more than 2 seconds to set the clock back by an hour.

Note:
- For summer time adjustment, make sure that the transfer-ready mark is not on the LCD.

OPERATING THE BUILT-IN TUNER

This recorder incorporates a voltage synthesized tuner with 48-channel preset capacity. Only channels stored can be called up with the TV PROG. buttons in modes other than Channel Set.

In the Channel Set mode, all channel numbers including skipped ones are successively displayed so that they can be stored or skipped.



Storing channels

1 Turn on the TV receiver and adjust it to your video channel.
2 Turn on the recorder.
- If "AU" is in the channel display, press one of the numeric keys to change it to any number.

3 Set the MANUAL/AUTO switch to AUTO.
4 Press the CH.SET button.
- The display will change to the Channel Set mode.

5 Press the SELECT button.
- The band indicator will blink.

6 Press either CH SEARCH button until the correct band indication appears.
- Pressing the "+" button changes the band indication in the following order: the first cycle of 1, 3, U for PAL and NTSC broadcasts including SECAM B/G and D/K broadcasts; the second cycle of 1, 3, U for SECAM L broadcast; and then the indication re-starts with the first cycle.
- Pressing the "–" button changes the indication in the opposite order.

7 Press the SELECT button.
- The sweep indicator will blink.

8 Keep either CH SEARCH button pressed for more than 2 seconds; the "Auto" indicator appears on the FDP and automatic scanning will take place.
- The sweep indicator will count down or up.
- When a broadcast is detected, scanning stops automatically.
- If the picture is not clear, press the "+" or "–" button for fine tuning.
- Press either CH SEARCH button to stop scanning.

9 Press the SELECT button when the desired broadcast signal is detected.
- The channel position number will blink.

10 Select a channel position into which you wish to store that station by using the CH SEARCH buttons while the channel position number is blinking.
11 Press the STORE button.
- The "colon" will disappear.
- Repeat steps **5** through **11** for all necessary channels.

12 Press the CH.SET button to disengage the Channel Set mode.

Skipping channels

1. Press TV PROG. to select the channel to be skipped.
2. Press CH. SET.
   - The band indicator and the sweep indicator corresponding to the broadcast stored in that channel will appear.
3. Press SKIP. The "colon" will appear.
4. Press CH. SET to disengage the Channel Set mode.

Selecting channels

Stored channels can be called up in ascending or descending order by using the TV PROG. buttons.
By using the numeric keys ⑪, direct-access channel selection is also possible.

Channel coverage and Available channels in each band

Band indicator	Frequency	Europe ch	France ch	USA ch	Japan ch
1	VHF band I (43 – 109 MHz)	E2 – E4 X, Y, Z, S1	2 – 4	2 – 6	1 – 3
3	VHF band III (108 – 300 MHz)	S2 – S10 E5 – E12 S11 – S20	5 – 10 CABLE ch B – Q 70 – 86	7 – 13 CABLE ch A-6 – A-3 A-1 – I J – W	4 – 12
U	UHF band (470 – 886 MHz)	E21 – E69	21 – 69	14 – 83	13 – 62

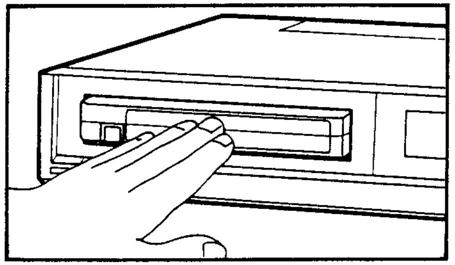
Notes:
- In automatic scan tuning for PAL and NTSC boradcasts, the NTSC indicator on the FDP lights continuously, unless a corresponding PAL broadcast is detected. The PAL indicator also lights when SECAM B/G and D/K broadcasts are detected.
- The SECAM indicator lights only when the scanning for SECAM L broadcast is taking place.
- If scanning does not stop when a signal too week to be detected is reached, set the MANUAL/AUTO switch to MANUAL and perform manual tuning for that channel.

LOADING AND UNLOADING A CASSETTE

Loading

Insert a cassette as illustrated. Be sure to insert it firmly into the slot; otherwise, it will be automatically ejected.

- The automatic loading mechanism will operate only when the cassette is inserted correctly.
- With a cassette inserted, the "cassette loaded" indicator will appear on the FDP.



Unloading

Press the ■/⏏ button ⑦ in the Stop mode.

AUTO POWER-ON AND AUTO PLAY SYSTEM

- The cassette can be loaded even when the power has not been turned on. Inserting a cassette into the loading slot turns the power on automatically.
- Inserting a cassette, with its safety tab removed, turns the recorder on and playback of the cassette begins automatically.

POWER-OFF EJECT SYSTEM

- The cassette can be unloaded even after the power has been turned off. If a cassette is inside, pressing the EJECT button turns the power on automatically and, after ejection of the cassette, shuts it off automatically.

CAUTION

- If unloading of a cassette is not possible, check to see whether the TIMER indicator is lit. If so, press the TIMER button so the TIMER indicator extinguishes.
- Do not attempt to pull out the cassette once automatic loading has started.

WARNING

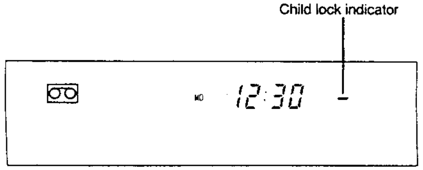
- Do not insert fingers or any foreign object beyond the door flap of the cassette loading slot, as this could lead to injury or damage to the mechanism. Show special caution with children.

CHILD LOCK FUNCTION

The Child Lock function is for preventing accidental operation by young children, or other unwanted operation, such as playing back or recording over an important cassette you may have left inserted in the recorder. By engaging the Child Lock mode, the operation buttons on the recorder become ineffective, unless the remote control is used.

To engage the Child Lock mode

- Press the remote control's OPERATE button ㉛ to turn the recorder power off and keep this button pressed for about 2 seconds after the power LED indicator has gone off.
- The Child Lock indicator (–) will appear in the channel display section on the FDP to show that the recorder is now in the Child Lock mode.



To disengage the Child Lock mode

- When the remote control's OPERATE button is pressed to turn the recorder power on, this disengages the Child Lock mode. The recorder will turn on and the corresponding display will appear with the channel number appearing where the child lock indicator appeared before.
- Pressing the TIMER button during timer recording also disengages the Child Lock mode.

Notes:

- While in the Child Lock mode, the recorder can receive timer programmed data from the remote control.
- Timer recording is possible also, even while in the Child Lock mode. After timer recording has been performed, the Child Lock mode remains in effect.
- Even after automatic cassette ejection at tape end, following timer recording, the Child Lock mode remains in effect.
- It is possible to insert a cassette while in the Child Lock mode. After inserting a cassette, the Child Lock mode remains in effect.

PLAYING BACK A VIDEO CASSETTE

Confirm the settings of the colour system select switches by referring to the chart on page 12.

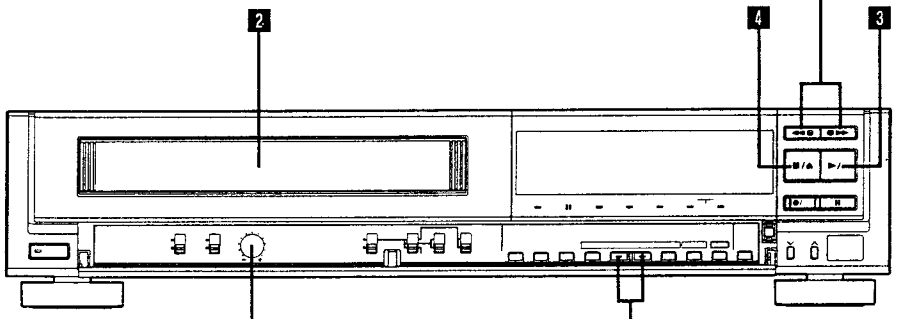
1. Turn the TV receiver on and adjust it to your video channel.
2. Load a pre-recorded cassette.
   - Power will be switched on automatically.
   - When the cassette loaded has no safety tab, playback will start automatically.
3. Press the ►/X2 button.
   - The VIDEO mode is automatically entered and the VIDEO indicator lights.
4. Press the ■/⏏ button at the end of the programme.
   - The tape will be rewound automatically when its end is reached and the recorder will enter the Stop mode.

SHUTTLE SEARCH

Shuttle Search allows high-speed playback at 9 times (PAL/SECAM/MESECAM) or 7 times (NTSC) normal speed in either direction.

1. Press either ◄◄ or ►► Shuttle Search button during playback.
2. To cancel the Search mode, press the ►/X2 button.

- For briefer scanning, keep the Shuttle Search button pressed for more than 2 seconds; when you release the button, the Search mode will be cancelled.



Picture Sharpness Adjustment

Images on the screen can be adjusted to a preferred softer or sharper definition by turning the PICTURE SHARPNESS control in the corresponding direction.

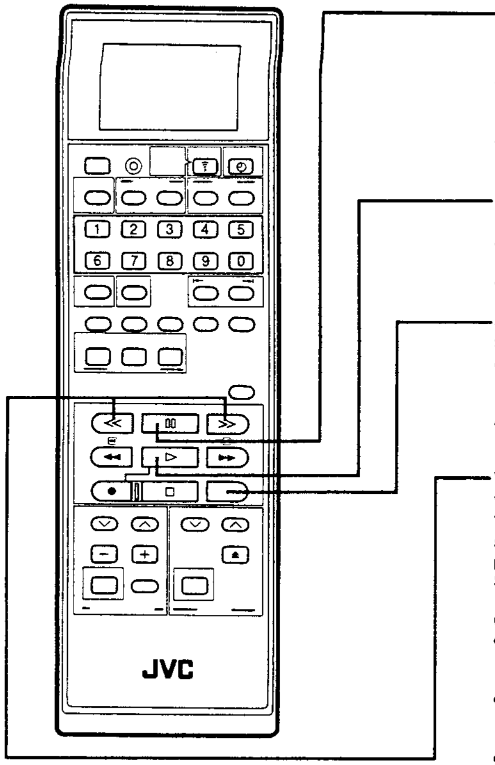
DIGITAL TRACKING SYSTEM

This recorder incorporates a digital tracking system for automatic tracking adjustment. In most cases you do not have to adjust tracking.

- When you start playback after inserting a tape, the digital tracking system automatically adjusts the tape path relative to the heads to obtain the best possible pictures.
- This automatic adjustment also takes place when the playback output level reduces below a certain level.
- The DIGITAL TRACKING indicator blinks while the system is searching for optimum tracking, and remains lit as long as the automatic tracking mode continues.

If automatic tracking fails, and some noise bars are visible on the screen, use the manual tracking mode.

- Press the TRACKING "–/+" buttons simultaneously to cancel the automatic mode, then press either button to move noise bars off the screen.
- To return to the automatic mode, press both buttons simultaneously.



STILL PLAYBACK AND FRAME ADVANCE

00 button

- To view a still picture, press this button in the Play mode.
- To advance the picture frame by frame, press this button again.
- To return to normal playback, press the ⊳/X2 button.
- When the Still mode continues for longer than about 5 minutes, the Stop mode will be entered automatically.

DOUBLE-SPEED PLAYBACK

⊳/X2 button

- Press while in the Play mode; double-speed playback will be engaged.
- To resume normal playback, press this button again.

SKIP SEARCH

SKIP SEARCH button

- During playback, press this button from 1 to 4 times to skip through 30-sec. to 2-min. sections of tape. Playback resumes automatically.
- Press the ⊳/X2 button to cancel the Skip Search mode midway.

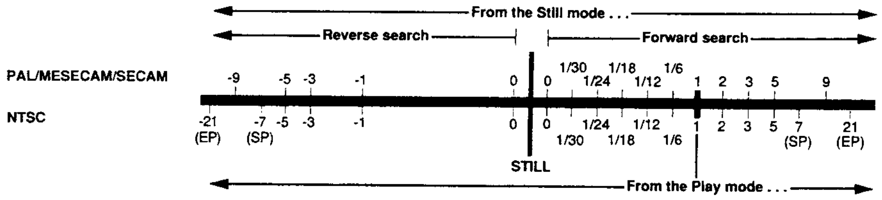
VARIABLE-SPEED SEARCH AND SLOW MOTION

Variable search buttons (<</>>)

The variable search buttons control both the direction and speed of tape search, making possible fast- and slow-motion playback in either forward or reverse direction from either the Still or Play mode.

Operation tips:

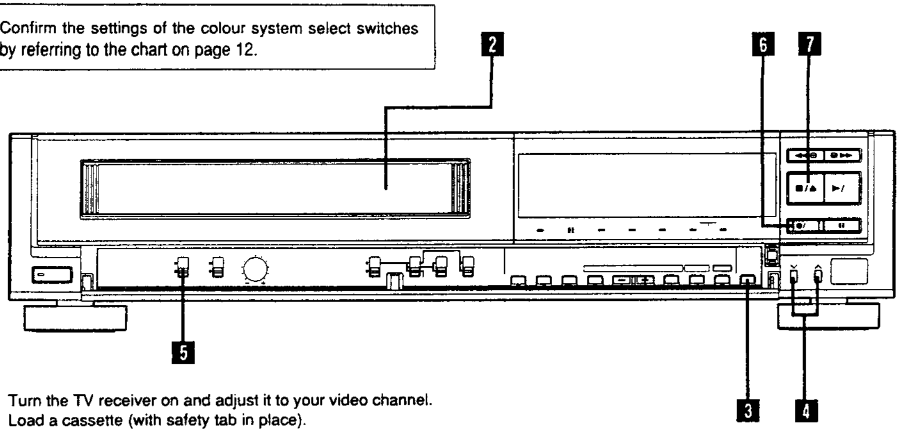
- To increase speed while in the forward direction, press >> repeatedly; to decrease, press << repeatedly. The direction reverses after leaving the Still mode.
- To increase speed while in the reverse direction, press << repeatedly; to decrease, press >> repeatedly. The direction reverses after leaving the Still mode.
- To return to normal playback, press the Play button.



Notes:

- With some televisions, the still picture may be unstable. If vertical vibration of the picture is observed, attempt to correct it by pressing the V.LOCK buttons.
- If noise bars are visible in the Special-Effects Playback mode, attempt to correct it in the manual tracking mode as described on page 17.
- No audio is available during any special-effects playback mode.
- During special-effects playback, no picture is available in the EP mode of the NTSC system.
- During special-effects playback in the LP mode of the PAL/MESECAM/SECAM system, the pictures will have no colour.

Confirm the settings of the colour system select switches by referring to the chart on page 12.



1 Turn the TV receiver on and adjust it to your video channel.

2 Load a cassette (with safety tab in place).
- Power will be switched on automatically.

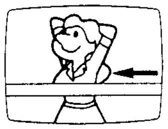
3 Press the TV/VIDEO button so that the VIDEO indicator lights.

4 Press either TV PROG. button to select the channel you wish to record.

5 Select the recording speed (SP or LP/EP (NTSC)).
SP: 4 hours with an E-240 cassette (PAL/SECAM)
2 hours and 40 minutes with a T-160 cassette (NTSC)
LP: 8 hours with an E-240 cassette (PAL/SECAM)
EP: 8 hours with a T-160 cassettes (NTSC)

6 Press the ●/ITR button to start recording.
- Be careful to press ●/ITR only once, or Instant Timer Recording will begin.
- Press the ● button ㉖ and ⊳/X2 button ㉕ simultaneously when using the remote control unit.
- If there is part of the programme you do not want to record, press the ❚❚ button. A white horizontal bar will appear on the screen, which reduces in size in 4 steps as time elapses. When the last quarter starts blinking and disappears, the Stop mode will be entered automatically. The pause duration is possible for about 5 minutes:

PAUSE MODE INDICATOR



- To continue recording from the Pause mode, press the ►/X2 button while the white bar is on-screen.

7 Press the ■/⏏ button at the end of the programme.
- When the end of the tape is reached during recording, the tape is automatically rewound and stops.

Notes:

- When recording is restarted from the Pause mode, assemble recording is performed so that the playback picture will not distort at the edit point.
- The selected channel cannot be altered during recording. If you wish to change the channel, first engage the Pause mode and then select a different channel.

INSTANT RECORDING

If you wish for recording to stop automatically after a certain period of time, use this Instant Timer Recording mode.

1. Press the ●/ITR button during recording (or twice if in the Stop mode).
   - Recording will begin and the FDP shows "ITR 0:30", indicating that recording will automatically stop and power will switch off after 30 minutes.
2. Adjust the switch-off time, if necessary.
   - Press ●/ITR to increase the time in 30-minute increments (possible up to 4 hours).
   - Use SELECT and SET to set to a more precise time when required (possible up to 8 hours 59 minutes). After setting the time, press SELECT so that all digits stop blinking.

RECORDING ONE PROGRAMME WHILE WATCHING ANOTHER

A programme not being viewed can be recorded while you enjoy another programme.

- Select the channel you wish to record with the recorder's channel select buttons.
- Select the channel you wish to view with the TV receiver's channel selector.
- With RF-only connection, the TV/VIDEO button should be in the TV mode (VIDEO indicator off). If the indicator is lit, press the TV/VIDEO button to turn it off.

24-HOUR INSTANT TIMER RECORDING

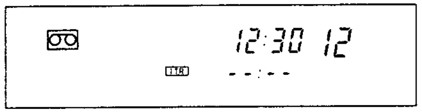
The 24-Hour Instant Timer Recording feature allows unattended automatic starting and stopping of the recording of a single programme which starts within a 24-hour period.

Preparations

1. Insert a cassette with its safety tab in place. The recorder turns on automatically.
2. Select the channel you wish to record from.
3. Select the recording speed, "SP", "LP" or "EP" (NTSC), by pressing the TAPE SPEED switch ⑫.

Setting the timer

1 Press the START button ㉓ to engage the 24-Hour Instant Timer Set mode. The following information, with the current time and "ITR --:--", will appear on the FDP.
- Each pressing delays the START time by 30 minutes.



2 After reaching the desired START time, press the ●/ITR button ⑥ the required number of times to set the desired length of recording time.

3 After confirming the START time and recording length, press the OPERATE button ⑪.
- "ITR" remains on the FDP and the 24-Hour Instant Timer Standby mode will be automatically engaged.
- If the programme has not been correctly preset, the "ITR" indicator will blink for about 10 seconds when the OPERATE button is pressed. Recheck the programmed data.

For a More Precise Setting of Start Time and Recording Length

- After first pressing the START button once, press the SELECT button ㉑. The hour digits for START time setting will flash.
- Set the hour with the SET "+/–" buttons ⑳, then press SELECT. The minute digits will flash.
- Set the minutes with the SET "+/–" buttons, then press SELECT. The hour digits for "ITR" setting will flash.
- Set the hour with the SET "+/–" buttons, then press SELECT. The minute digits will flash.
- Set the minutes with the SET "+/–" buttons.

Notes:
- At each step of the timer setting procedure, if no time is entered within 10 seconds, the Instant Timer Set mode is cancelled, and the current time is displayed.
- To cancel the Instant Timer Set mode, press the CANCEL button ⑰ twice.
- 24-Hour Instant Timer Recording has priority over other timer programme settings; therefore, no other programmes, set for timer recording, will be recorded until 24-Hour Instant Timer Recording has been executed.

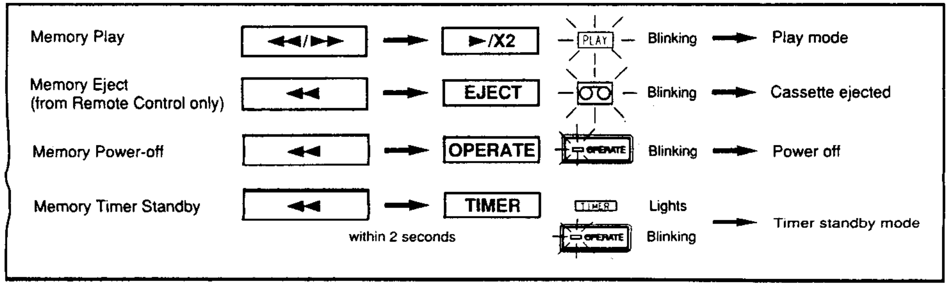
NEXT-FUNCTION MEMORY

Memory Play function

- If you want to watch the tape from its beginning after rewinding, press ◀◀ and then the ►/X2 button within 2 seconds. Playback will start automatically at the beginning of the tape. (Check to see that the counter memory indicator "M" is off.)
- If you want to watch the tape from the counter reading of "0H 00M 00S", press the COUNTER MEMORY button, then the ◀◀ (or ▶▶) button and then the ►/X2 button within 2 seconds.
- While the tape is being rewound, the PLAY indicator is blinking. To cancel the Memory Play mode and go to another mode, press the corresponding button (■/▲, ►/X2, ◀◀, ▶▶).

Memory Eject/Power-Off/Timer Standby

If you are going to eject the cassette, turn the power off or engage the Timer Standby mode after rewinding the tape, you do not have to wait for completion of rewind to press the corresponding button.
- To eject the cassette after rewind, press remote control's ◀◀ and then EJECT within 2 seconds. (To cancel the Memory Eject mode, press □.)
- To turn the power off after rewind, press ◀◀ and then the OPERATE button within 2 seconds. (To cancel the Memory Power-off mode, press OPERATE).
- To engage the Timer Standby mode after rewind, press ◀◀ and then the TIMER button within 2 seconds. (To cancel the Memory Timer Standby mode, press TIMER).



INDEX SEARCH FUNCTION

The Index Search function gives you automatic access to locations on the tape where index codes are recorded. Index codes are recorded automatically at the beginning of recordings which are started from the Stop or Timer Standby mode, or recorded manually at any other position during recording or playback. Unnecessary codes can be erased manually during playback. In neither case is these any effect on the audio or video recordings on the tape. With this recorder, you can access any one of up to 99 of these indexed segments in either the forward or reverse direction.

Using the Index Search function

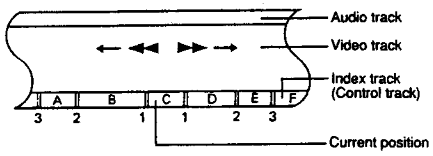
1 Press the INDEX button ⑮ while in the Play or Stop mode.
- The channel display of the FDP will change to the Index Search mode and the "INDX" indicator will light.

2 Specify the index number (1 — 99) using the numeric keys ⑪ within 10 seconds.
- The specified number will appear in the FDP.

3 Press either ◀◀ or ▶▶ button ㉔.
- The tape will move and the index numbers count down to 0, where normal playback will start.
- If the INDEX button was pressed in the Play mode, the screen will show search pictures; if the button was pressed in the Stop mode, then the index codes are detected in the much faster Rewind or Fast-Forward mode.

Notes:
- To cancel the Index Search mode before completion, press the ▷/X2 button ㉕ or □ button ㉗.
- If the end of the tape is reached while still in the Index Search mode, the mode is cancelled and the tape rewound.

Tips for specifying the index number



- "1" + ▶▶ moves playback to the beginning of segment D.
- "1" + ◀◀ moves playback to the beginning of segment C.
- "2" + ◀◀ moves playback to the beginning of segment B.
- If no number is entered, a value of "1" is assumed.

Changing the index codes

MARK button ⑰

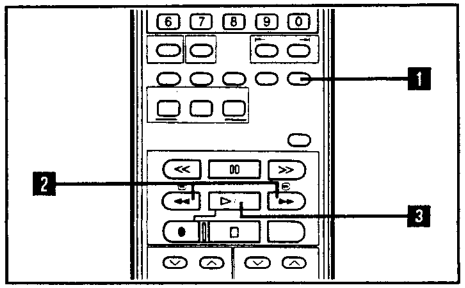
In the Play or Record mode, press this button once to put an index code onto the tape. "INDX" appears on the FDP and blinks during the marking process.

ERASE button ⑯

In the Play or Still mode, press this button to erase the next index code. The tape is automatically fast-forwarded and when an index code is detected, it will be erased automatically. "INDX" remains lit on the FDP during the searching process and blinks during the erasing process.

Notes:
- Index codes cannot be added or erased on a tape with its safety tab removed.
- The Erase mode is cancelled either after one index code has been erased or after the Play mode is cancelled.

INTRO SEARCH FUNCTION



The Intro Search function lets you visually check the contents of each recording by playing back in fast motion a short segment of a programme each time an index code is detected.

1 Press the INTRO button while in the Play or Stop mode.
- The INDX indicator on the FDP will light.

2 Press the ◀◀ or ▶▶ button within 2 seconds.
- The Intro Search will start in the corresponding direction.
- Each time an index code is detected, the corresponding part is played back in the Search mode for about 5 seconds.

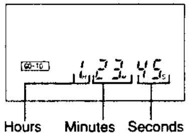
3 When you find the section you want to view, simply press the ▷/X2 button.
- Normal playback will start.

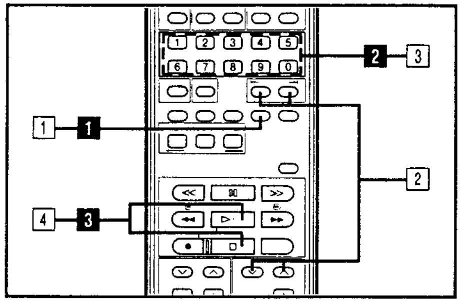
REALTIME TAPE COUNTER

Unlike usual tape counters which show tape locations in numbers, this realtime tape counter shows tape time precisely *in hours, minutes and seconds in all modes (Record, Play,* Rewind, Fast Forward).

Time Go-To function

The time Go-To function gives you direct access to any point on the tape by simply specifying the time from the beginning of the tape.





1 Press the GO-TO button while in the Play, Stop or Still mode.
- The counter will change to the Go-To mode.

2 Specify the time (from the beginning of the tape) to the point to be located, by using the numeric keys .

3 Press the ▷/X2 button or □ button.
- Always key in a full number.
- *Depending on the situation, search will take place either* in the Shuttle Search mode or in the Rewind or Fast Forward mode which is much faster than the Shuttle Search mode. After the specified point is reached, playback starts automatically or the tape stops automatically depending on the command.

Pressing ▷/X2 from Play or Still mode:	Shuttle Search — Automatic start of playback
Pressing ▷/X2 from Stop mode:	Rewind or Fast-Forward — Automatic start of playback
Pressing □ from Play, Still or Stop mode:	Rewind or Fast-Forward — Automatic stop

- If the recorder did not detect the leader tape when the cassette was loaded (indicated by "-H –M –S" when the GO-TO button is pressed), the tape is first rewound to the beginning of the tape and then is fast-forwarded to the specified point.

Time Search function

The Time Search function lets you locate a point on the tape a specified time span away from the current position in either direction.

1 Press GO-TO while in the Play, Stop or Still mode.

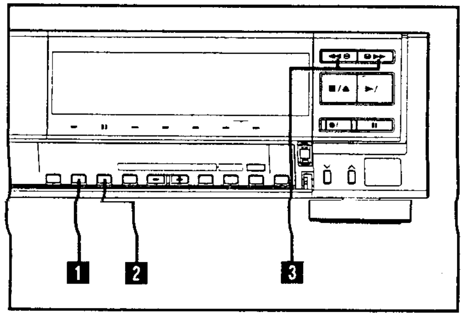
2 Press the CURSOR ⊢/⊣ buttons or the TV PROG. ∨/∧ buttons to specify the direction of search.

3 Specify the time (from the current position) to the point to be located, by using the numeric keys.

4 Press ▷/X2 or □.
- The tape will move to the specified point and automatically start playback or stop.

Notes:
- Each step in the operation procedure must be followed by the next within 60 seconds, otherwise the Go-To or Search mode will be cancelled.
- If the GO-TO button was pressed in the Play or Still mode, when the specified point is reached, a still picture will be displayed as a result of having pressed the ▯▯ button instead of ▷/X2 or □, after having keyed in the time.
- Use of other control buttons, while in either the Time Go-To or Search mode, cancels that mode.
- If the specified time exceeds the tape length, the tape fast forwards to the end and then rewinds to the beginning and stops.

COUNTER MEMORY FUNCTION/LAP TIME INDICATION



Counter Memory function

1 Press the COUNTER RESET button at a point which you may wish to locate later.
- The counter will read "0H 00M 00S".

2 Press the COUNTER MEMORY button. "M" will appear in the FDP.

3 Press the ◄◄ (or ►►) button when you need to return to the designated point.
The tape will rewind (or fast forward) and stop at about the "0H 00M 00S" counter reading automatically.

Lap Time Indication

When you need to know the exact time of a recording, press the COUNTER RESET button before starting recording or playback. The counter will be reset to "0H 00M 00S" and show the exact elapsed time as the tape runs.

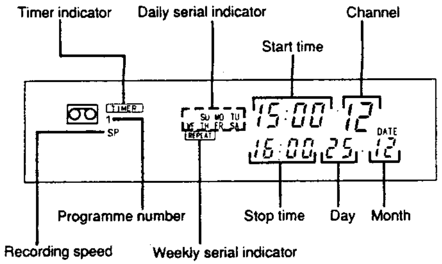
AUTOMATIC TIMER RECORDING

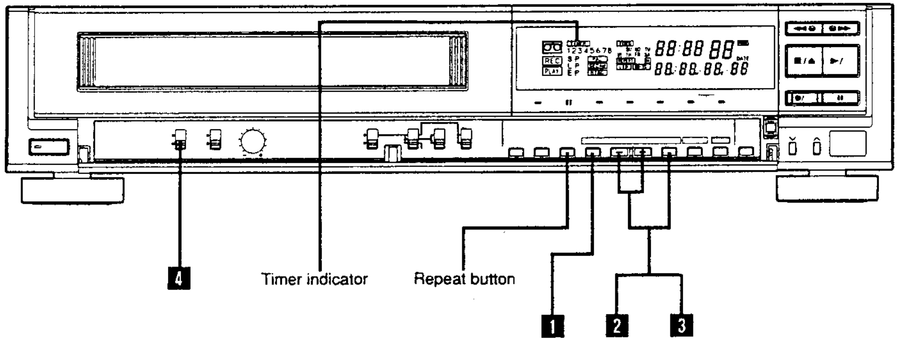
First of all, load a cassette (with safety tab in place); power will be switched on automatically.

Two ways to perform timer programming

A. **Local programming:** Programme the timer using the recorder's controls while referring to the recorder's FDP.

B. **Independent remote programming:** Programme the remote control's memory using the remote control's keys while referring to its own LCD and then transfer the data to the recorder anytime at your convenience.





A. Local Programming

1 Press PROGRAM button.
- The display will change to the Timer Set mode for programme number "1". To advance to programme number 2 – 8, press either SET button a required number of times.

2 Set the start time by using the SELECT button and the SET buttons.
- Select the item to be set with the SELECT button; the selected item will blink.
- Set the desired data with the SET –/+ buttons.
- To record a weekly serial, press the REPEAT button once.
- To record a daily serial starting on a certain day, press REPEAT twice.

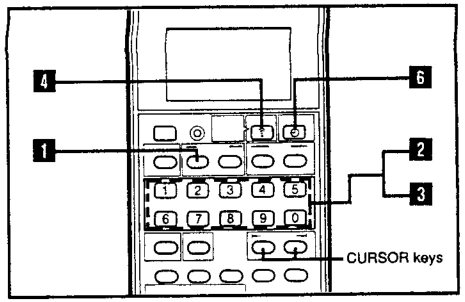
3 Set the stop time, date and channel in succession in the same way as for setting the start time.
- To record a daily serial starting on the day of setting, there is no need to enter any date figure; simply advance to the next item.
- For programming the timer to record an external source, while the channel position is blinking, press SET –/+ until the "AU" indicator appears in the channel display section of the FDP.

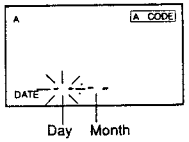
4 Select the recording speed (SP or LP/EP (NTSC)).

5 After making sure that the cassette is loaded, press the TIMER button.
- The Timer Recording Standby mode will be engaged with the TIMER indicator and the preset programme number(s) illuminated and the power turned off.
- With no cassette loaded, the TIMER and "cassette loaded" indicators will continue blinking.
- A cassette whose safety tab has been removed will be ejected automatically.
- If a preset programme contains errors, the programme number will not illuminate. Recheck the programmed data.

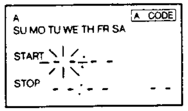
B. Independent Remote Programming

- The remote control incorporates 4 programme memories (A, B, C and D).
- The programmed data is held in memory even after it has been transferred to the recorder.

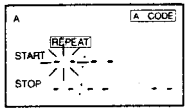




1. Press the MEMORY PROG. button.
   - The LCD will be activated for programme memory "A".
   - To advance to programmes B to D, press again.
2. Enter the date using the numeric keys.
   - Invalid numbers will be rejected.
   - To record a daily serial starting on the day of setting, press the CURSOR key "—⊣" without entering any date figure.
   - To record a daily serial starting on a certain day, press [8] and enter the date.
   - To record a weekly serial, press [9] and enter the date.

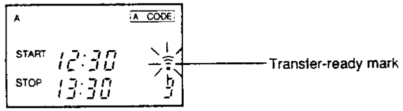


For daily serial setting



For weekly serial setting

3. Enter the start time, stop time and channel in succession.
   - To key in a one-digit number of hours or minutes, first press [0]. Then press the relevant numeric key.
   - For programming the timer to record an external source, press the numeric key "0" while the channel is blinking; "AU" will appear on the LCD. When transferred in step **4**, "AU" will appear in the channel display section on the FDP.
   - After the channel has been entered, the transfer-ready mark will appear and blink.



4. Direct the remote control to the recorder's Remote Sensor window and press the TRANS button.
   - The programmed data will be loaded in one of the recorder's memories (1—8), the vacant one of the smallest programme number.
   - If all programme memories are full, the recorder's clock will blink and transmission will not take place.
   - Call up the programme(s) to be cancelled by pressing the VTR PROG. button, then press the VTR CANCEL button to cancel it. Data transfer can now be made by pressing TRANS again.
5. Confirm the setting of the TAPE SPEED switch ⓬ on the recorder.
6. Press the TIMER button.
   - Check to see that the TIMER indicator appears on the FDP.

How to use the CURSOR keys (⊢—/—⊣)

- If you press a wrong key and the blinking position has advanced, press ⊢— to return to the previous position for correction.
- Once all data have been programmed, you can reach any position for correction using ⊢— or —⊣. The blinking position is ready for re-entry.
- Pressing the MEMORY PROG. buttonon the remote control, engages the LCD in the transfer-ready mode in which the transfer-ready mark is blinking and data correction is not possible. For correction of data, press either cursor key to move to the position which requires correction.

Setting the date, start and stop times, and channel

- It is not possible to set the date, start and stop times unless the date and clock have previously been set.
- Enter the data while the digits are blinking.
- The stop time can be set within 24 hours of the start time.
- Non-applicable numbers (such as January 32, February 30 for dates, 24 or larger for hours, 60 or larger for minutes and 49 or larger for channels) will be rejected when keyed in.

Cancelling the preset data

- The preset programmes can be cancelled. First disengage the Timer Standby mode and engage the Timer Set mode for the programme number you wish to cancel and then press the CANCEL button ⓱ or the VTR CANCEL button. Or for the remote control's memory, press the MEMORY CANCEL button.
- An executed programme is automatically cleared.

Checking the programmed data

- Checking can be performed anytime, even after the TIMER button has already been engaged. To do this, press the PROGRAM button ⓳while in the Timer Standby mode. The programme number will blink on the FDP and you can check each programme by advancing programme numbers with the SET buttons ⓴. If re-programming is required, disengage the Timer Standby mode and use the regular programming method. Pressing the PROGRAM button and/or SET buttons engages the FDP in the check mode in which no position blinks and data correction is not possible. For correction of data, press the SELECT button ㉑ and move the cursor to a position which requires correction.

Timer recording operation

- When the preset start time is reached, recording starts.
- After timer recording, the power is switched off. If the end of the tape is reached during timer recording, the cassette is automatically ejected and then the power is switched off.

RECORDING FROM AN EXTERNAL SOURCE

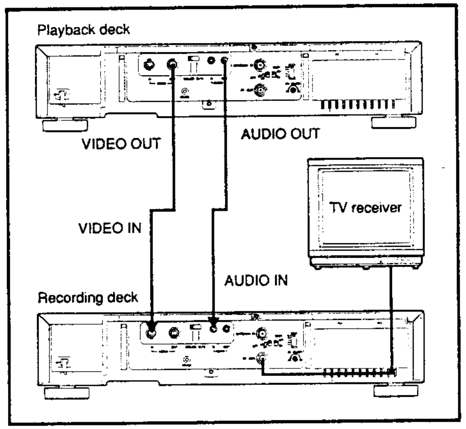
By connecting an external video source (such as a 2nd video recorder, VideoMovie camera-recorder, etc.) to the AUDIO and VIDEO IN connectors, tape-to-tape transfer is possible.

- For connection of these units an appropriate cable is necessary.

Connection

1. Connect the AUDIO and VIDEO IN connectors to the appropriate audio and video outputs of the 2nd video recorder.
2. Connect a TV receiver to the recorder to monitor the picture while recording.

Confirm the signal system of the camera being used and set the colour system select switches correctly to suit the camera. (See page 12.)



Operation

1. Turn the power on for all connected equipment.
2. Tune the TV receiver to your video channel.
3. Load a cassette with its safety tab in place.
4. Press the TV/VIDEO button ㉔ to engage the VIDEO mode.
5. Press either TV PROG. button ㉕ or the numeric key 0/AUX ⑪ to obtain "AU" in the channel display section on the FDP.
6. Set the TAPE SPEED switch ⓬ as required.
7. Press the ●/ITR button ❻ and the ❚❚ button ❿ to put the recorder in the Record-Pause mode.
8. Play back a tape on the source equipment to determine the segment to be recorded.
9. Press the ►/X2 button ❾ to start recording.
10. To stop recording temporarily, press the ❚❚ button.
11. To end recording, press the ■/⏏ button ❼.

Note:

- For the operation of the source equipment, refer to the instruction manual of the relevant machine.

Editing from a VideoMovie

This recorder is equipped with a remote PAUSE terminal. When the recorder is connected to a VideoMovie which incorporates a Master Edit Control system, you can control the recorder with the VideoMovie's controls for making edits free of transition-point gaps and distortion. Refer to the VideoMovie's instruction manual for detailed operating procedures for editing.

Note:

- For direct recording with a video camera, a camera adapter is also necessary.

DUET EDITING

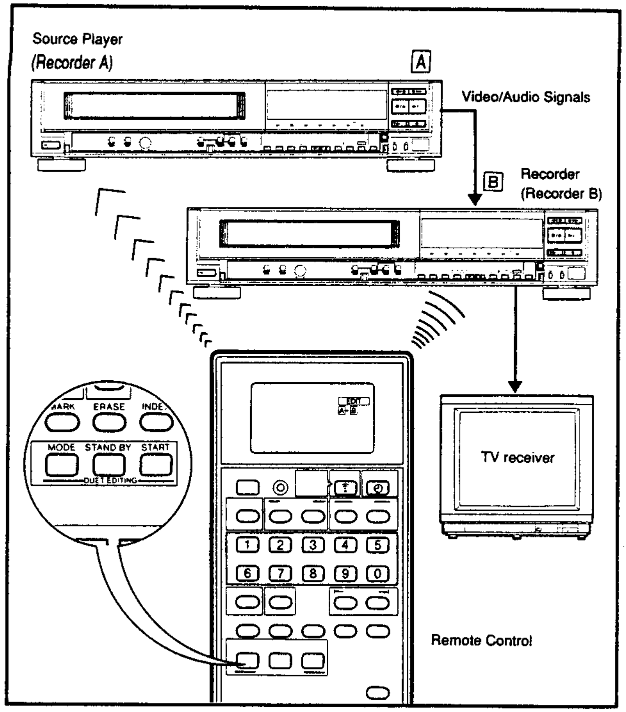
Designed specifically to simplify editing operations, the Duet Editing function delivers separate commands to two recorders simultaneously via a single remote control, taking advantage of the A/B code system. (JVC dedicated models only)

Preparations

- Connect two recorders as described in "RECORDING FROM AN EXTERNAL SOURCE" on the previous page.
- Set one recorder to respond to A code signals, the other, to respond to B code signals. (See page 7.)
- Place the two recorders side by side.

Notes:

- JVC video recorders with infrared remote control units which are not equipped with an A/B code select switch are designed to receive A code signals. Therefore, Duet Editing is possible with JVC decks if the HR-D637MS is set to respond to B code signals.
- It is not possible to perform Duet Editing unless the remote control's clock has been previously set.



OPERATION

Remote Control	Recorder A (Source player)	Recorder B (Recorder)
	Load a recorded tape.	Load a blank tape.
1. Press MODE. "EDIT Ⓐ → Ⓑ" appears on LCD.		
2. Press STAND-BY.	Enters STILL mode.	Enters RECORD-PAUSE mode.
3. Search for an edit-in point on the source tape. Press ❚❚.	Functions as commanded. (In this state, only recorder A responds to the remote control's commands.)	Remains in RECORD-PAUSE mode.
4. Press START.	Enters PLAY mode.	Enters RECORD mode.
5. Press ❚❚.	Enters STILL mode.	Enters RECORD-PAUSE mode.
6. Repeat steps 3, 4 and 5 to continue editing.		

Notes:

- You can use Recorder B (the recorder set to respond to B code signals) as a source player and Recorder A as a recorder. In this case, press the A/B CODE button after step 1 to obtain "EDIT Ⓑ → Ⓐ" indication.
- To cancel the Duet Edit mode and return to normal remote control functions, press the MODE button so that the EDIT indication disappears.
- When the START button is pressed, the recorder takes a few seconds before actual editing starts due to the automatic backspace editing system. At the same time the START button is pressed, the player starts playback from the specified edit-in point. Therefore, it is recommended that you specify a point slightly before the intended edit-in point in step 3 for more accurate editing. This also ensures that the picture of the resulting edit will be more stable.

IN CASE OF DIFFICULTY

What may initially appear to be trouble is not always a real problem. Make sure first ...

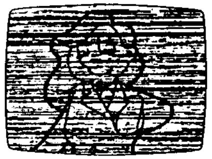
Symptoms	Check points
No power is applied to the recorder.	• Is the power cord disconnected? — Connect it.
Playback picture does not appear while the tape is running.	• Is the TV receiver's channel selector set to the correct video channel? — Set it to the RF converter channel. (See page 8.)
Picture is normal but no sound.	• Is the system select switch set to the appropriate position? — Set to M, G, I, L or K depending on the system of your television receiver.
Tape does not run during recording.	• Is the ❚❚ button engaged? — Press the ►/X2 button.
Recording cannot be started.	• Is a cassette loaded? • Is the safety tab on the cassette removed? — Reseal the slot with cellophane tape.
Tape stops in the Rewind or Fast-Forward mode.	• Is the COUNTER MEMORY switch set so that "M" appears on the FDP? — Press to make "M" disappear.
Tape will not rewind or fast forward.	• Is the tape already fully rewound or fast forwarded? — Check the cassette.
Noise appears during playback.	• Press TRACKING buttons. (See page 17.)
Pressing ❚❚ during playback brings a still picture (in a frame-by-frame manner) with noise bars.	• Noise bars can be eliminated by pressing the ❚❚ button a few more times.
Snowy picture on screen when viewing TV programmes while recording another programme.	• Is the VIDEO indicator on? — Press the TV/VIDEO button so that the indicator extinguishes. (With AV connection, the indicator and the TV/VIDEO button have no effect.)

This recorder contains microcomputers. External electronic noise or interference could cause malfunctioning. In such cases, switch the power off and unplug the power cord. Then plug it in again and switch on. Take out the cassette. After checking the cassette, operate the unit as usual.

HEAD CLEANING

- Picture playback may become blurred or interrupted while the TV programme received is clear. This does not mean that the recorded programme has been erased.
- Dirt accumulated on the video heads after long periods of use causes such problems. In this case, head cleaning requiring highly technical care is necessary.

For head cleaning, consult the nearest JVC dealer.



SECTION 1

DISASSEMBLY AND MECHANISM ADJUSTMENTS

1.1 DISASSEMBLY

1.1.1 Top cover

1. Refer to Fig. 1-1-1 and set for the EJECT (Stop) mode and disconnect VCR from AC power.
2. Take out 4 screws Ⓐ and 1 screw Ⓑ. To remove the top cover, slide it in the direction of the arrow and lift it away.

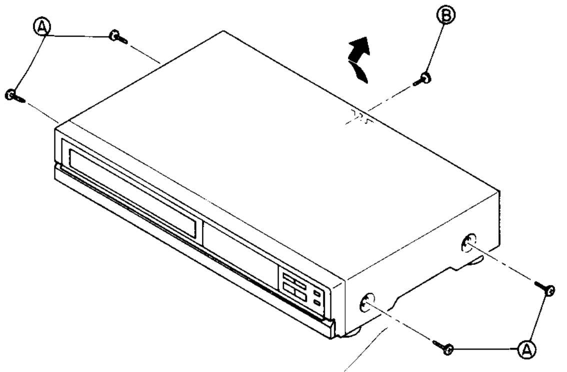


Fig. 1-1-1

1.1.2 Front panel assembly

1. Remove the top cover.
2. Carefully disengage 3 tabs Ⓒ of the front panel assembly from the upper side of the chassis.
3. Refer to Fig. 1-1-2 and pull the front panel assembly forward you to disengage 3 tabs Ⓓ of the front panel assembly from the bottom side of the chassis, then remove the front panel assembly.

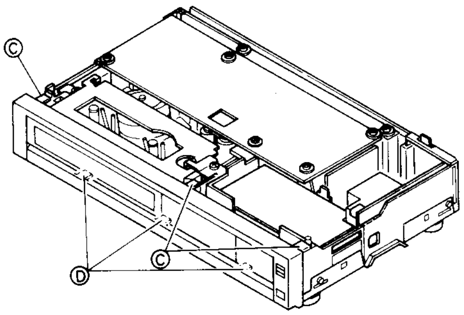


Fig. 1-1-2

1.1.3 Bottom cover

1. Remove the top cover.
2. Refer to Fig. 1-1-3 and take out 4 screws Ⓔ and 2 screws Ⓕ from the bottom of the chassis.
3. Disengage the bottom cover from 4 claws Ⓖ on the bottom of the chassis.

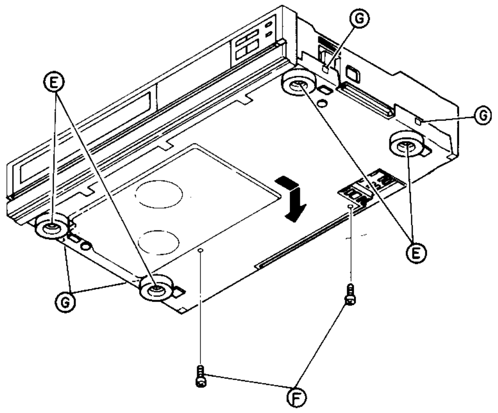


Fig. 1-1-3

1.1.4 Main board assembly

1. Remove the top cover.
2. Refer to Fig. 1-1-4 and take out 5 screws Ⓗ and 1 screw Ⓘ from main board assembly.

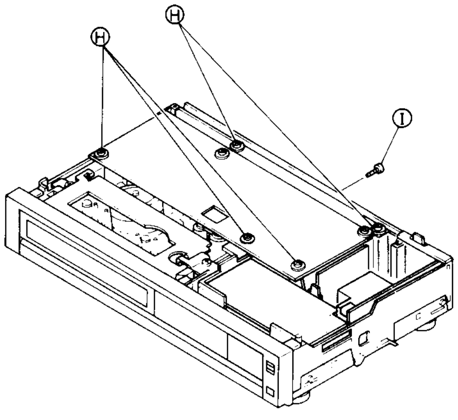


Fig. 1-1-4

1.1.5 Cassette housing

1. Remove the top cover and main board assembly.
2. Refer to Figs. 1-1-5 and 1-1-6.
   Take out 4 screws Ⓙ that secure the cassette housing. Disengage 3 tabs Ⓚ of the front panel and pull the front panel forward where it does not interfere with removing the cassette housing.
   Remove the cassette housing in the upward direction.

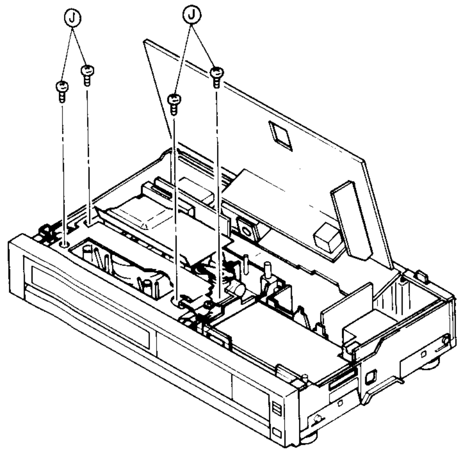


Fig. 1-1-5

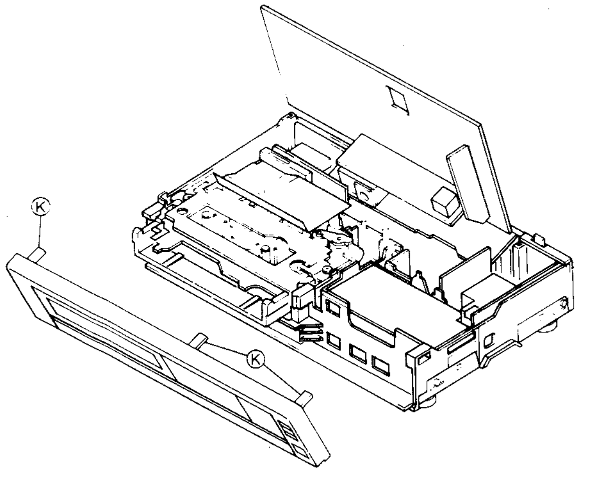


Fig. 1-1-6

1.1.6 Cassette housing installation

1. On the main deck, observe the positional relationships of the parts indicated in Fig. 1-1-7.
   If necessary, turn the loading motor by hand to obtain these positions.

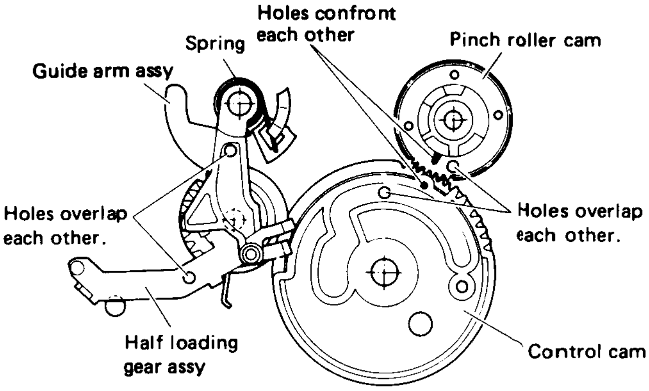

Holes confront each other
Spring
Pinch roller cam
Guide arm assy
Holes overlap each other.
Holes overlap each other.
Half loading gear assy
Control cam

Fig. 1-1-7

2. Refer to Fig. 1-1-8 and confirm that the clutch is engaged.
   If necessary, press the lever indicated by the arrow to where the clutch is locked.

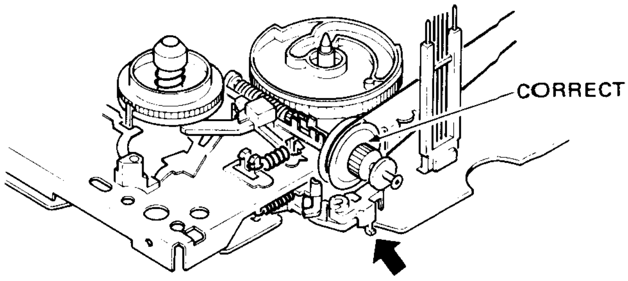


Fig. 1-1-8

3. Check that the cassette housing is in the eject state (internal holder of the cassette housing is locked in raised position).
   Set the cassette housing into place and secure with 4 screws.
4. Install the front panel as shown in Fig. 1-1-9 and re-engage the tabs. Supply power and use a spare cassette to check for normal loading and eject operations.

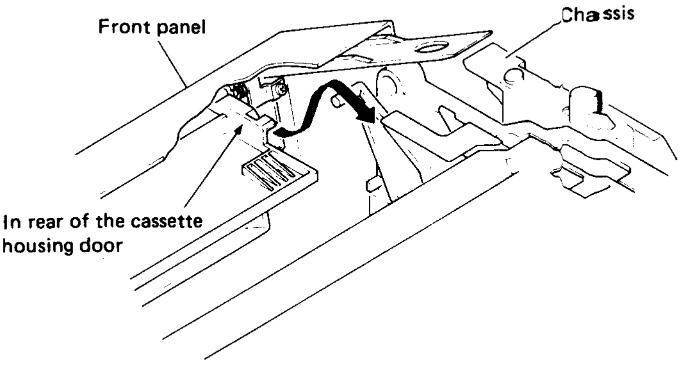

Front panel
Chassis
In rear of the cassette housing door

Fig. 1-1-9

5. Disconnect VCR from power, then reinstall the main board assembly and top cover.

1.1.7 Cassette housing door

1. Remove the top cover and front panel assembly.
2. Take out one screw Ⓛ of the front panel assembly.
3. Refer to Fig. 1-1-10 and use care regarding the torsion spring, then pull out the left end of the cassette housing door to move it.

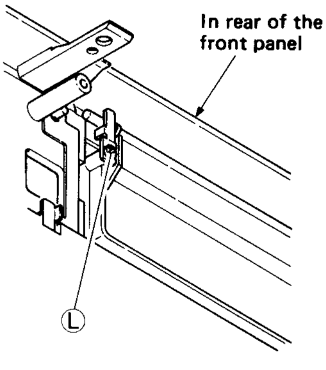


Fig. 1-1-10

1.1.8 Main-deck

1. Remove the top cover, front panel assembly and main board assembly.
2. Refer to Fig. 1-1-11 and take out 3 screws Ⓜ from the main-deck assembly.
3. Remove the main-deck assembly in the upward direction and disconnect a connector of CN601 from the Mechacon board, connectors of CN1, CN2 from the Pre/Rec board, connectors of CN1, CN2 from the A/C head board, a connector of CN1 from the Loading MDA board and a connector of CN1 from the Drum MDA board.

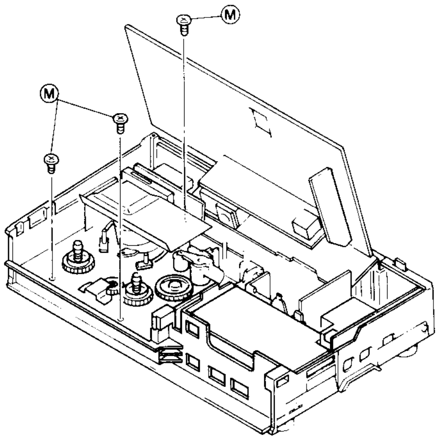


Fig. 1-1-11

1.2 MECHANISM ADJUSTMENTS

1.2.1 Precautions

1. Disconnect mainframe from AC power before soldering.
2. Avoid imparting stress to wires when disengaging connectors.
3. Determine and correct the cause of difficulty before proceeding to adjustments. Do not disturb settings unnecessarily.
4. Use care not to damage tabs, claws, etc. during repairs.
5. Install the cassette housing assembly only when the mechanism is in the Eject or Stop mode position. In the Eject mode, the internal holder of the housing is fully raised. This is fully lowered in the Stop mode.
6. When installing the front panel assembly, be sure to engage the housing door with the door lever of the cassette housing assembly. If this is omitted, the door will not open at Eject and the cassette cannot be removed.

1.2.2 Check without cassette housing

Mechanism operations can be observed easily by removing the cassette housing assembly. Note the following.

1. Disable the photo transistor sensor (END SENSOR) on the main-deck by applying an opaque cover.
2. Connect pins 2 and 3 of MECHACON board connector CN601.
3. Select the desired modes with the operation buttons. However, notice that without tape, setting for the reverse direction modes produces the Stop mode after a few seconds due to absence of the reel sensor output.

1.2.3 Manually removing cassette tape

In event of electrical system failure that prevents the tape from being unloaded, the tape can be removed manually by the following procedure. Refer to Figs. 1-3-1, 1-3-2 and 1-3-3.

1. Disconnect power cord from AC outlet.
2. Turn the loading motor by hand so that the control cam rotates clockwise. This retracts the pole base assembly to the unloading position.
3. Continue turning to where the guide arm and half loading gear assemblies shift to beneath the cassette.
4. Turn the clutch assembly (capstan motot) at the rear of the deck to absorb slack tape within the cassette.
5. Again turn the loading motor in the same direction to raise the cassette and remove it.

1.2.4 Test equipment

The following special tools and fixtures are required for mechanism adjustment.

1. Alignment tape: MH-2
   Stairstep signal is employed for interchangeability checks and adjustments.
2. Torque gauge : PUJ48075-2
   Measures tape take-up torque.
3. Back tension cassette gauge : PUJ48076-2
   Measures tape tension at the supply side.
4. A/C head positioning tool : PUJ47351-2
   Shifts the head base for adjusting the control head position.
5. Roller driver : PTU94002
   Turns the guide roller for adjusting FM linearity.

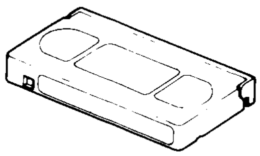
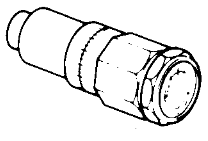
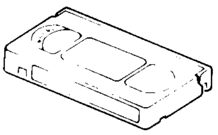
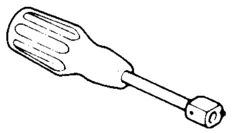
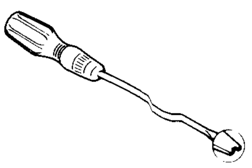
Alignment tapes 1	Torque gauge 2	Back tension cassette gauge 3	A/C head positioning tool 4	Roller driver 5
				

Fig. 1-2-4 Test equipment

1.3 MAIN MECHANISM PARTS

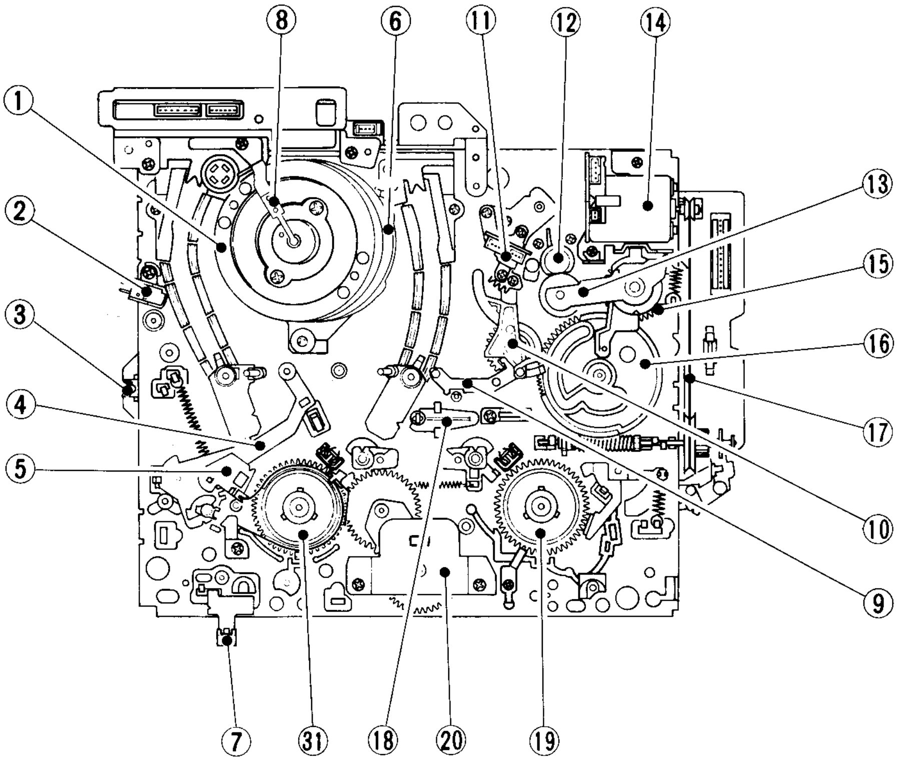

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Fig. 1-3-1 Top view of main-deck

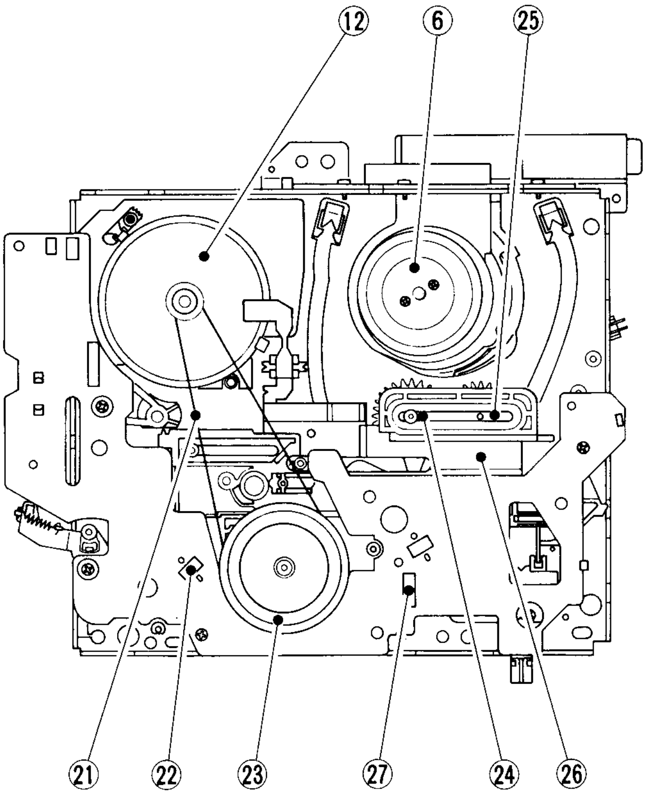


Fig. 1-3-2 Bottom view of main-deck

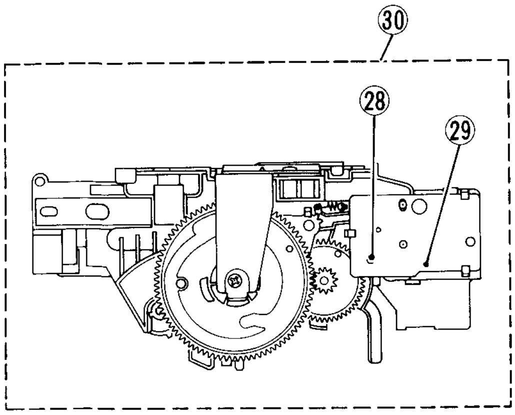


Fig. 1-3-3 Side view of cassette housing

A. Cleaning

Periodic cleaning of the tape transport system is desirable, but ordinarily not feasible in practice. Therefore, perform cleaning when a set is brought in for repairs or maintenance. Contamination of the video heads, tape guides and brushes can detract from playback picture quality and in extreme cases, even damage the tape. For cleaning, use a fine-mesh cotton cloth (about the texture of a white dress-shirt) moistened in alcohol.

- To clean the video heads, press the moistened cloth gently against the upper drum with fingertip and turn the drum by hand.
- Do not use a vertical stroke, as this may damage the heads.

B. Lubrication

Oil and grease do not normally require periodic replenshing. Apply only when replacing lubricated parts (also clean and replace lubrication of mating parts if soiled).

For parts and points to apply oil and grease, refer to the exploded views of the mechanism assembly.

Before oiling, clean with alcohol.
Apply one or two drops of oil. Avoid excess oil.

1. Table 1-1 indicates the oil and grease used in this set. Use these or recommended locally available equivalents.

Category	Part No.
Oil	COSMO-HV56
Grease	KANTO-G-31KAV

Table 1-1

2. Grease is not required for a replacement cassette housing assembly, as this has been applied at the factory.

Note: ***Stir grease that has been stored for an extended period.***

C. Main mechanical parts

See Figs. 1-3-1, 1-3-2 and 1-3-3.

No.	Symbol	Parts Name	See Section
1	M32A	Upper drum assy	
2	M44	Full erase head	
3	51Q1	End sensor	
4	M41	Tension arm assy	1.5.4
5	M42	Tension band assy	1.5.4
6	M32C	Lower drum motor assy	1.5.2
7	M461	REC safety switch (S2)	
8	M32D	Brush assy	
9	M449	Half loading gear assy	1.5.5
10	M447	Guide arm assy	1.5.5
11	M48	A/C head	1.5.3
12	M422	Capstan motor	
13	M442	Pinch roller arm assy	
14	M434	Loading motor assy	
15	M446	Pinch roller cam	1.5.5
16	M438	Control cam	1.5.5
17	M437	Loading belt	
18	M460	LED holder (D1)	
19	M430	Reel disk (take-up)	
20	M424	Idler gear assy	
21	M429	Reel belt	
22	51PHS1	Take up reel sensor (PHS1)	
23	M426	Clutch assy	1.5.6
24	M433	Take up loading arm assy	1.5.7
25	M432	Supply loading arm assy	1.5.7
26	M439	Plate assy	1.5.7
27	M462	Slide switch (S3)	
28	56PHS3	Cassette sensor (PHS3)	
29	56Q2	Start sensor (Q2)	
30	M36	Cassette housing assy	
31	M470	Reel disk (supply)	

- Symbol interpretation example

M32A
└ Ref. No.
└ Exploded view symbol

56 Q2
└ Ref. No.
└ Board No.

1.4 INSPECTION AND MAINTENANCE

This product employs rotary and moving parts which wear out in the course of usage. Periodic inspection, cleaning, lubrication and maintenance are therefore important for ensuring maximum performance. Worn parts must also be replaced at when required.

1.4.1 Suggested servicing schedule for main components

The following table indicates the suggested period for such service measures as cleaning, lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions. However, the indicated components should be inspected when a set is brought for service and the maintenance work performed if necessary.

Also note that rubber parts may deform in time, even if the set is not used.

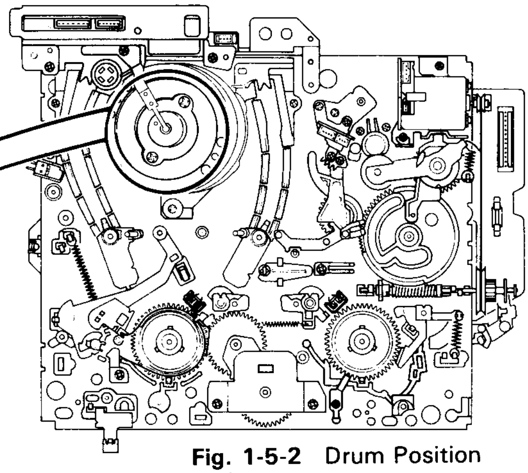
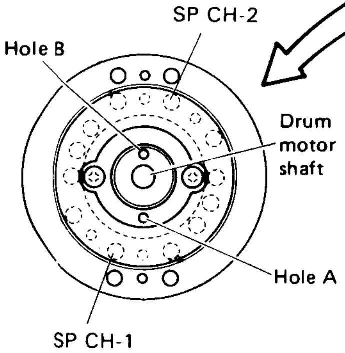
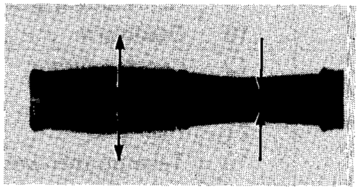
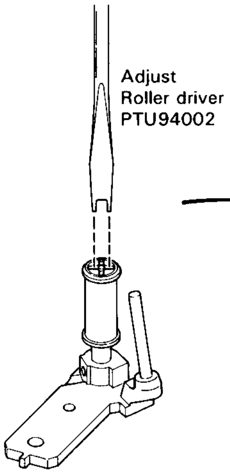
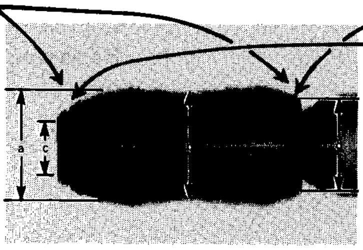
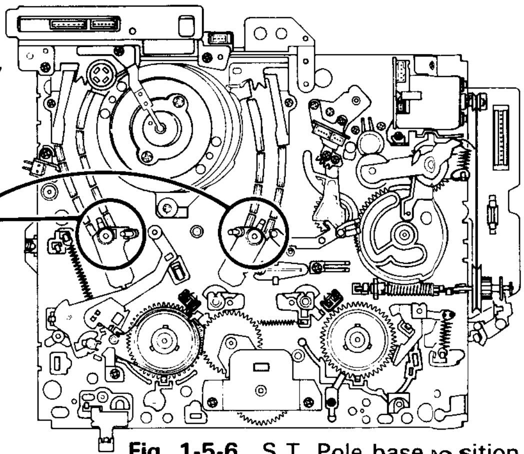
System	No.	Parts Name	Symbol No.	Periodic servicing schedule (operation hours)								
				250	500	750	1000	1250	1500	1750	2000	Overhaul
Tape Transport	1	Upper drum	M32A	★	★	☆	○	○	○	○	○	●
	11	A/C head	M48	★	★	★	○	○	○	○	○	●
	13	Pinch roller	M442	★	★	★	○	○	○	○	○	●
	2	Full erase head	M44	★	★	★	○	○	○	○	○	●
	4	Tension arm	M41									●
	6	Lower drum	M32C				○	○	○	○	○	●
	12	Capstan (shaft)	M422	★	★	★	★	★	★	★	★	●
	9	Half loading gear	M449									●
	10	Guide arm	M447									●
Drive	12	Capstan motor	M422				○	○	○	○	○	●
	17	Loading Belt	M437				○	○	○	○	○	●
	21	Reel Belt	M424				○	○	○	○	○	●
	19	Take-up reel disk	M430				○	○	○	○	○	●
	31	Supply reel disk	M470				○	○	○	○	○	●
	23	Clutch assy	M426								○	●
	14	Loading motor	M434				○	○	○	○	○	●
		Worm clutch assy	M436								△	●
	26	Plate assy	M439								△	●
Others	5	Tension band	M42				○				○	●
	8	Brush	M32D				○				○	●

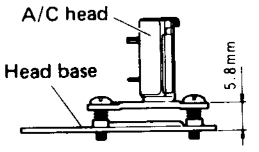
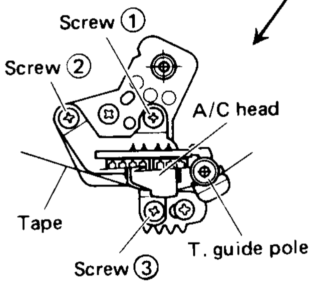
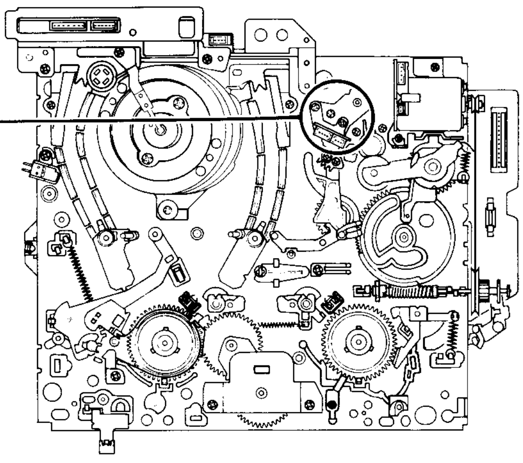
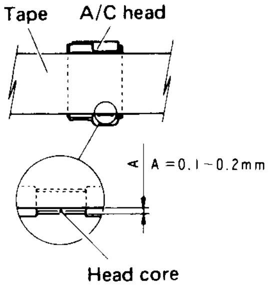
★ : Cleaning
☆ : Cleaning (or Replacement if necessary)
△ : Lubrication
No: Refer to Main mechanical parts

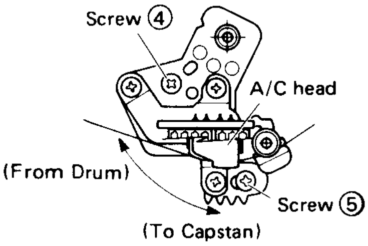
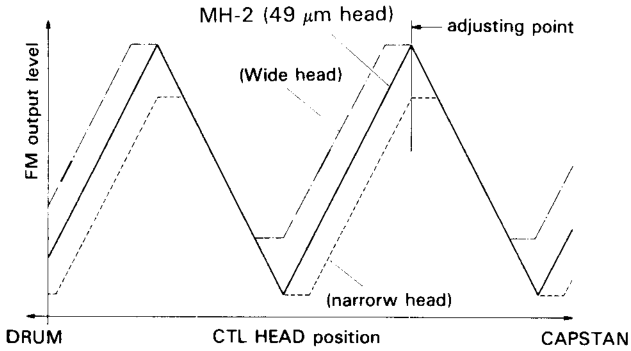
▲ : Lubrication (or Replacement if necessary)
● : Replacement
○ : Inspection or Replacement if necessary

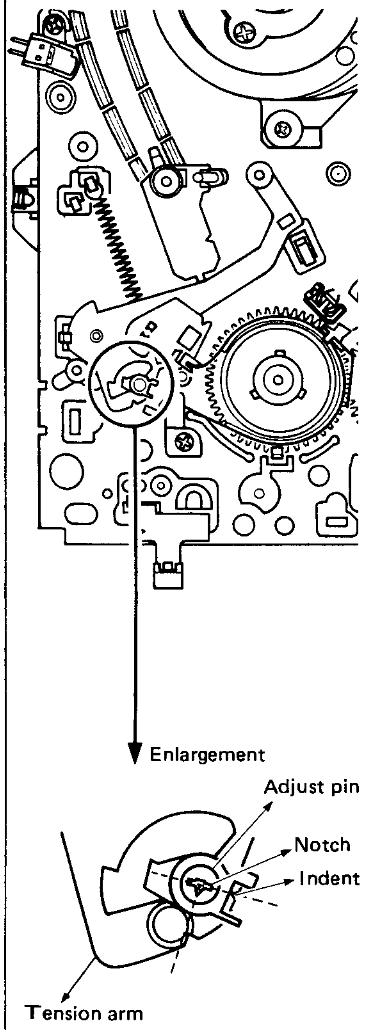
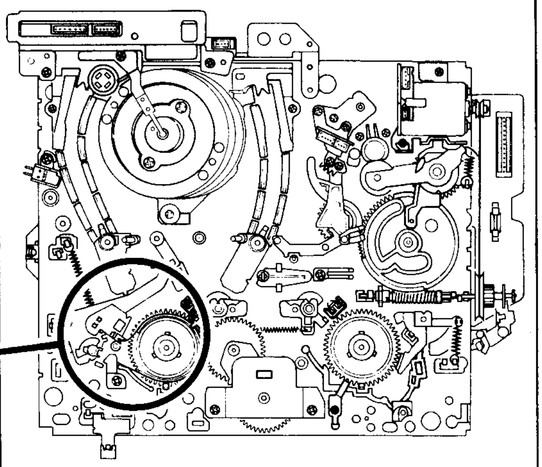
Table 1-4-1 Approximate maintenance schedule

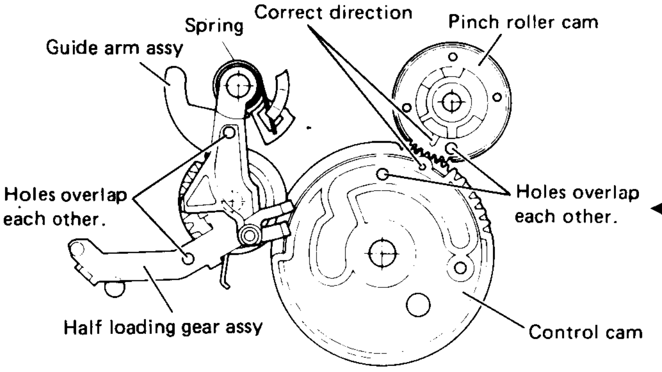
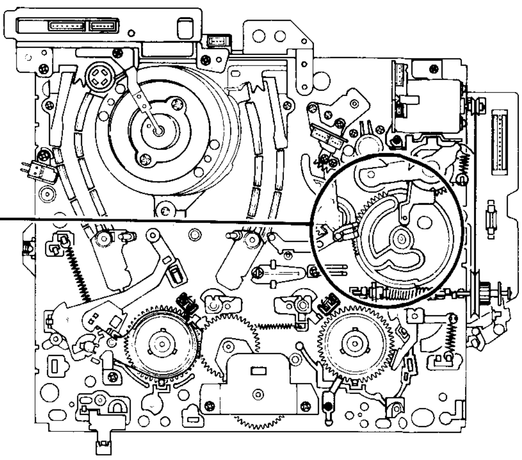
1.5 MAIN PARTS REMOVAL AND REPLACEMENT

No.	Item	Checkpoints	Adjustment and Checks
1	Upper drum assembly •Symptoms: FM signal absent, intermittent or weak on one channel; large difference in channel output levels •Cause: Worn or damaged video heads, poor response, etc.		Fig. 1-5-2 Drum Position
	 **Fig. 1-5-1** DRUM TOP VIEW	Mounting direction See Fig. 1-5-1. (Symptom: no picture)	After replacing, observe that upper drum hole A is opposite the motor axis from lower drum hole B.
		Axis wobble See Fig. 1-5-2. (Symptom: jitter, poor FM linearity) PB FM: Main board TP306 FF: Servo board TP411	Record and playback in SP mode. Confirm absence of large difference between channels. (Fig. 1-5-3)  **Fig. 1-5-3** Axis wobble
	 **Fig. 1-5-4** S.T. Pole base	FM linearity check See Fig. 1-5-5. (Symptom: vertical sync absent, picture noise) PB FM: Main board TP306 FF: Servo board TP411  **Fig. 1-5-5** FM linearity $\frac{b}{a} \geqq 0.7, \frac{c}{a} \geqq 0.65, \frac{d}{a} \geqq 0.65$	 **Fig. 1-5-6** S.T. Pole base position 1) Play stairstep signal of the MH-2 Alignment Tape. Confirm absence of obvious FM waveform loss and that operating the Tracking yields the optimum point. 2) Refer to Fig. 1-5-4, adjust for loss at the left edge (drum entry) of the FM waveform by turning the guide roller of the supply pole base. Similarly, adjust for loss at the right edge (drum exit) by turning the guide roller of the take-up pole base. **Note:** ***If FM loss occurs on both channels and cannot be corrected by adjusting the guide rollers, the lower drum needs replacement.***

No.	Item	Checkpoints	Adjustment and Checks
2	Lower drum assembly •Symptoms: Poor FM linearity, noisy rotation, jitter •Cause: Lead and bearing wear	Check FM linearity and switching point.	See above upper drum assembly items.
		Check control head phase (X value) Symptom: tracking error PB FM: Main board TP306 FF: Servo board TP411	1) Play stairstep signals of MH-2 Alignment Tape. Engage the Tracking Preset mode by pressing the + and – buttons simultaneously in the onscreen mode. Confirm that the same maximum FM waveform level is obtained as when the tracking is adjusted manually. 2) Refer to the A/C head adjustments.
3	A/C head  **Fig. 1-5-7** Temporary height  Screw ① Screw ② A/C head Tape T. guide pole Screw ③ **Fig. 1-5-8** Inclination/Azimuth/ Height adj.	 **Fig. 1-5-9** A/C HEAD position Temporarily set height as indicated in Fig. 1-5-7.	Set the height as indicated in Fig. 1-5-7 to facilitate tape transport checks and adjustments.
		Tilt (forward inclination) See Fig. 1-5-8. (Symptom: audio level varies greatly.)	1) Run tape, turn screw ① counterclockwise to where slight curling of the tape occurs at the lower flange of the take-up guide roller. 2) Then slowly turn the screw clockwise to where the curling ceases.
		Azimuth See Fig. 1-5-8. (Symptoms: audio low level or noisy) Audio output: Main board AUDIO OUT	1) Play stairstep signal (with audio 6 kHz) of the MH-2 Alignment Tape. Observe audio output signal with oscilloscope. 2) Turn screw ② and adjust for maximum audio output level.
	 **Fig. 1-5-10** Height Adj	Height See Figs. 1-5-8 and 1-5-10. (Symptom: low audio and control signal levels)	1) Run tape and observe the control head area. 2) Turn screws ①, ② and ③ by small and equal amounts until 0.1 to 0.2 mm of the head core bottom can be seen. Note: *If difficult to observe, play stairstep signal of MH-2 Alignment Tape and adjust for maximum audio output and control pulse level.*

No.	Item	Checkpoints	Adjustment and Checks
		FM linearity	Refer to upper drum assembly items. If adjustment is major, again check the azimuth.
	 Screw ④ A/C head (From Drum) Screw ⑤ (To Capstan) **Fig. 1-5-11** CTL head phase  **Fig. 1-5-12** CTL head phase **Note:** *Trigger the oscilloscope externally signal from TP411 (DRUM FF). Use (+) trigger for MH-2 alignment tape.*	Control head phase See Fig. 1-5-11 PB FM: Main board TP306 FF: SERVO board TP411	1) Play stairstep signal of MH-2 Alignment Tape and observe the FM waveform. Set for Tracking Preset by pressing the + and – buttons simultaneously in the onscreen mode. 2) Loosen screws ④ and ⑤. Set the A/C head positioning tool on screw ④, with the stud inserted into the nearby oblong hole. 3) Turn the tool first to position the A/C head fully toward the capstan. Then gradually return it toward the drum and stop at the position of maximum FM waveform output level as shown in Fig. 1-5-12. 4) Tighten screw ⑤. Remove the tool and tighten screw ④.
		EP auto tracking adjustment	1) Terminate the video output at 75 ohms with a monitor-TV and connect oscilloscope to PB FM (TP306). 2) Set MH-2L Alignment Tape into the cassette housing and play the stairstep signal. 3) Confirm that the A/V digital tracking LED changes from flashing to lighted. 4) Press button "D" of the preset unit (PTU 94008) to extinguish the A/V digital tracking LED. 5) Again press button "D" to enter the LP interchangeability adjust mode. Confirm that the A/V digital tracking LED changes from flashing to extinguished. Press the stop button. **Note:** *If the Alignment Tape ejects automatically, repeat the control head phase adjustment.*

No.	Item	Checkpoints	Adjustment and Checks
4	Tension arm assembly Tension band assembly  Fig. 1-5-13 Tension arm assy	Tension pole position See Fig. 1-5-13. (Symptom: poor FM waveform response)	 Fig. 1-5-14 Tension arm position 1) Check that the cassette housing is in the eject state (internal holder of the cassette housing is locked in raised position). 2) Turn the eccentric adjust pin to align the notch of the pin with the tension arm indent as shown in Fig. 1-5-13.
		Back tension (Symptom: skew)	1) When the tension pole position is correctly adjusted, the back tension will assume the correct value. 2) Use the Back Tension Cassette Gauge and set for the playback mode. Confirm reading of 22 to 35. 3) Changing the tension pole position in order to vary the back tension will cause adverse effects elsewhere.

No.	Item	Checkpoints	Adjustment and Checks
5	Pinch roller cam Control cam Half loading gear assembly Guide arm assembly		Set mechanism to Eject mode internal holder of the cassette housing is locked in raised) position.
	 Spring Correct direction Pinch roller cam Guide arm assy Holes overlap each other. Holes overlap each other. Half loading gear assy Control cam Fig. 1-5-15 Control/Pinch roller cam		 Fig. 1-5-16 Control cam position
		Important: Do not remove or disturb parts other than those mentioned. See Fig. 1-5-15.	1) When installing the pinch roller cam, overlap the largest hole of the gear portion with the hole of the deck. 2) Set the control cam on the deck with the hole of the groove overlapped with the hole of the deck. Observe that the small hole of the control cam and the ridge of the pinch roller cam are aligned. (If the control cam does not fit readily, shift the rear plate assembly within the range of play.) 3) Install the half loading gear assembly with the hole overlapped with the hole of the deck. Secure with E-ring. 4) Install the guide assembly over the spring and with the hole overlapping that of the deck. Engage the spring correctly.
		Cassette housing assembly	Install the cassette housing assembly with the mechanism in the Eject mode. Also observe that the inner holder of the housing is raised and locked.
6	Clutch assembly	Take-up torque (Symptom: inadequate take-up torque)	1) Remove cassette housing and set for playback mode (see Section 1.2). 2) Set torque gauge on the take-up reel disk. Gradually relax your grip on the gauge and read the needle indication at the point the gauge begins to rotate with the disk. Confirm indication of 60 to 100.

No.	Item	Checkpoints	Adjustment and Checks
7	Take-up loading arm assembly Supply loading arm assembly Plate assembly		Note: • *Set mechanism to the Eject or Stop mode before removing these parts.* • *The flange of the plastic rivet securing the loading arm assembly and the pole base assembly can be damaged by attempting to remove it directly. Press the loading arm assembly firmly to prevent motion. Then use a narrow-shafted tool to press the rivet from the shaft end to remove it.*
		Mounting position alignment • Remove the tension arm assembly to facilitate operation. See Fig. 1-5-17.	1) Set the supply and take-up loading arm assemblies so that the holes of the gear portions are aligned, then secure to the pole base assemblies with rivets. 2) Shift the plate assembly and install with the holes of the upper and lower components overlapped.
		Slide switch See Fig. 1-5-17	Be sure to engage the slide switch slider with the edge of the plate assembly.

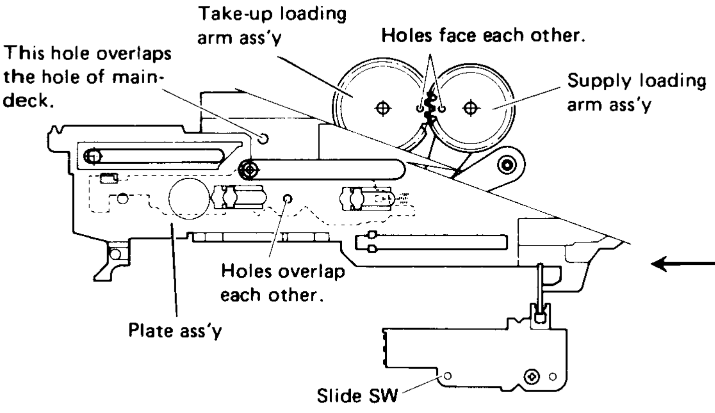

Take-up loading arm ass'y
Holes face each other.
This hole overlaps the hole of main-deck.
Supply loading arm ass'y
Holes overlap each other.
Plate ass'y
Slide SW

Fig. 1-5-17

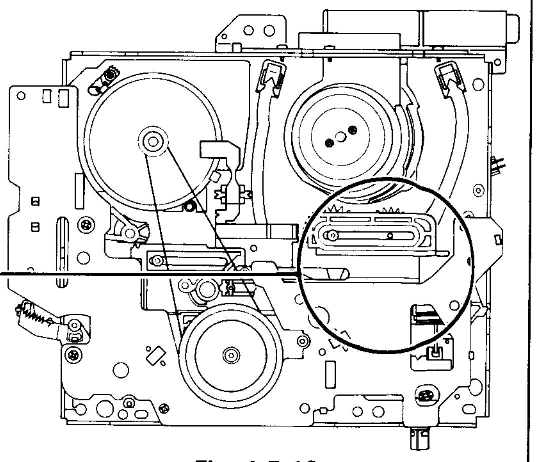


Fig. 1-5-18
T.S. Loading arm position

SECTION 2
ELECTRICAL ADJUSTMENTS

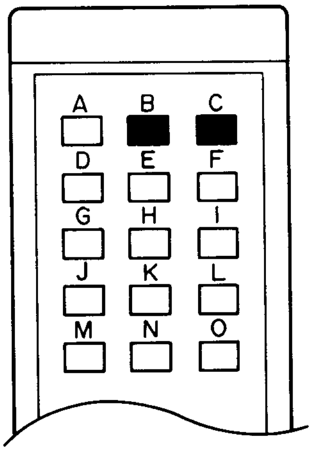
2.1 PREPARATION

Electrical adjustments are required after replacing circuit components and certain mechanical parts.
It is important to perform these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.

2.1.1 Required test equipment

1. Colour television or monitor
2. Oscilloscope: wide-band, dual-trace, triggered delayed sweep
3. Frequency counter
4. Audio oscillator
5. Audio voltmeter
6. Digital voltmeter
7. Signal generator: RF/IF sweep/marker
8. Signal generator: PAL/NTSC color bar, stairstep, video sweeper
9. Signal generator: Audio multiplex TV signal generator
10. Recording tape
11. Alignment tape: MH-2, MH-1
12. Presetting unit

Presetting unit


A
B
C
D
E
F
G
H
I
J
K
L
M
N
O

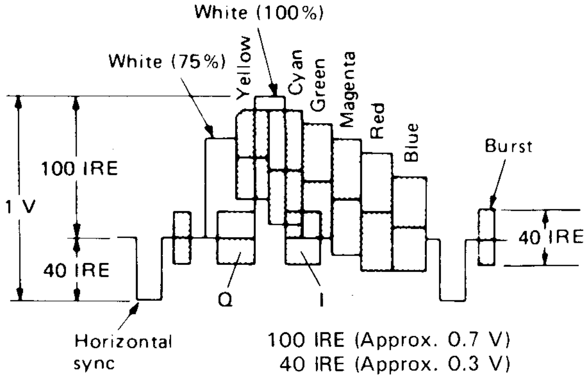

White (100%)
White (75%)
Yellow
Cyan
Green
Magenta
Red
Blue
Burst
100 IRE
1 V
40 IRE
40 IRE
Q
I
Horizontal sync
100 IRE (Approx. 0.7 V)
40 IRE (Approx. 0.3 V)

Fig. 2-1-1 NTSC Colour bar signal of pattern generator

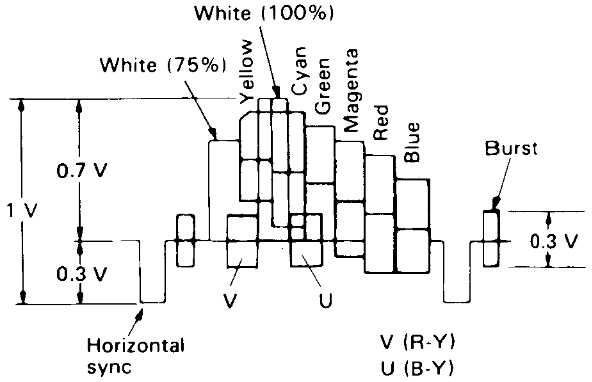

White (100%)
White (75%)
Yellow
Cyan
Green
Magenta
Red
Blue
Burst
0.7 V
1 V
0.3 V
0.3 V
V
U
Horizontal sync
V (R-Y)
U (B-Y)

Fig. 2-1-2 PAL Colour bar signal of waveform

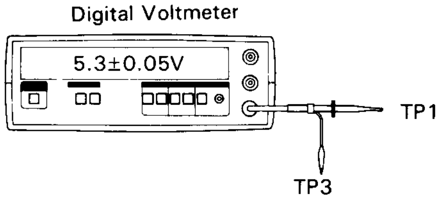
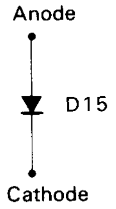
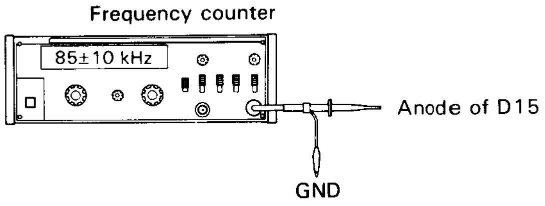
2.1.2 Check and adjustment steps

The check and adjustment steps are provided in the following in the form of charts. For clarity, the nomenclature used in the charts is outlined below.

No.	Checks and adjustments are numbered in the recommended sequence in which they are to be performed.
Item	Name assigned to the particular check and adjustment step.
Check Point	Location to which measuring instrument (oscilloscope unless otherwise noted) is to be connected.
Adjustment Parts	Variable component (resistor, capacitor, etc.) to be adjusted in this step. Dash (–) indicates check only.
Signal & Mode	• Input signal required to perform adjustment. Dash (–) indicates that special signal is not required. • Equipment operating mode at time of check or adjustment.
Colour bars	Colour bars signal as video input.
Stairstep	Stairstep signal as video input.
1 kHz	1 kHz sinewave as audio input signal.
MH-2 colour bars	Colour bars segment of MH-2 alignment tape.
MH-2 stairstep	Stairstep segment of MH-2 alignment tape.
MH-2 1 kHz	1 kHz audio signal segment of MH-2 alignment tape.
MH-2 RF sweep	RF sweep segment of MH-2 alignment tape.
E-E	Power on and machine in Stop mode.
REC	Recording mode
PB	Playback mode
SEARCH	Search (FWDS and REVS) playback mode
SLOW	Slow motion playback mode
STILL	Pause during playback mode
SP mode	SP recording speed
Description	This column provides an explanation of the step, notes and adjustment values, and reference to waveforms where applicable.

2.2 SWITCHING REGULATOR CIRCUIT

Note: *Unless otherwise specified, all test points and adjustments are located on the SWITCHING REGULATOR board.*

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	5V DC OUTPUT	TP1 (INPUT) TP3 (GND)	R37 (SWD 5 V ADJ)	• Tuner mode • REC • SP mode	1) Set recording video cassette into the cassette housing and set for the REC mode. 2) Connect a digital voltmeter as shown in Fig. 2-2-1. 3) Adjust R37 for 5.3±0.05 V  **Fig. 2-2-1**
2	Confirmation of oscillation	Anode of D15 		• Tuner mode • REC • SP mode	1) Set recording video cassette into the cassette housing and set for the REC mode. 2) Connect a frequency counter as shown in Fig. 2-2-2.  **Fig. 2-2-2**

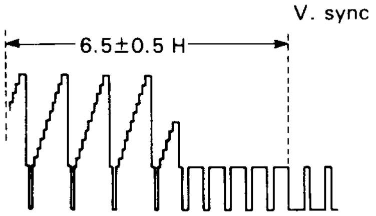
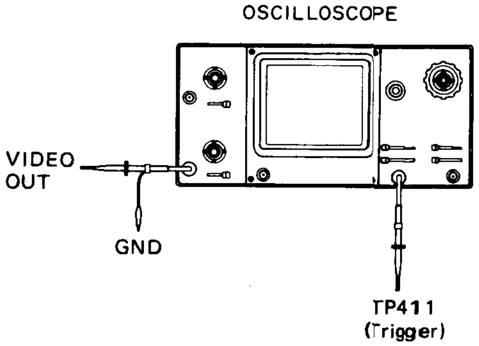
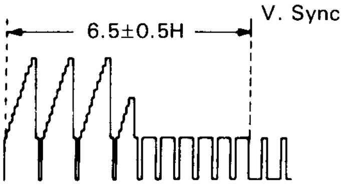
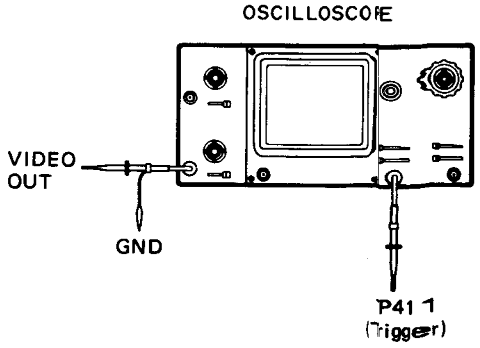
2.3 TIMER CIRCUIT

Note: *Unless otherwise specified, all test points and adjustments are located on the TIMER board.*

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Clock	IC1-16	C6 (clock)	•E-E	1) Disconnect VCR from AC. Connect a frequency counter between IC1-16 and GND. 2) Short TP1 to GND, then short the leads of capacitor C3 once in order to reset IC1. 3) Connect VCR to AC. All FDP segments and power LED are on. 4) Adjust C6 for 2048.000±0.002 Hz (488.2808 to 488.2818 μs).

2.4 SERVO CIRCUIT

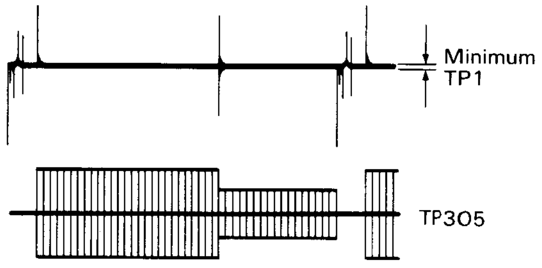
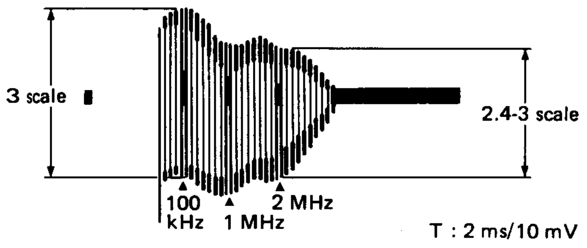
Notes: *Unless otherwise specified, all test points and adjustments are located on the SERVO board.*

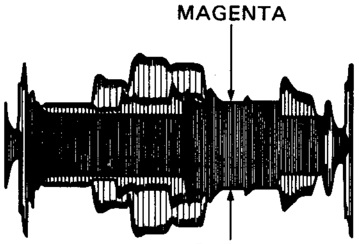
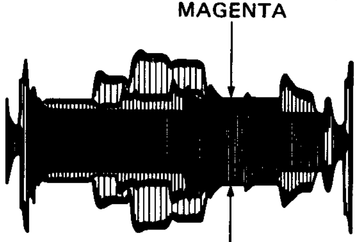
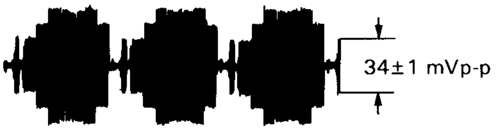
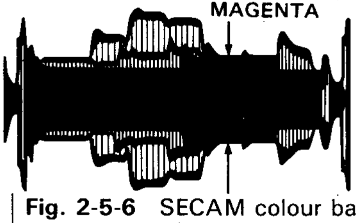
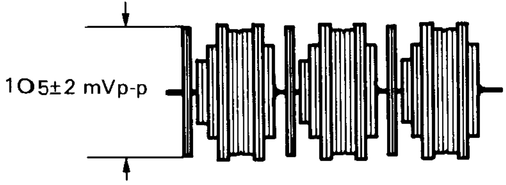
No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	SP PB switching point	TP310 (VIDEO OUT) (MAIN BOARD)  6.5±0.5 H V. sync	R421 (P/S SW POINT)	•PB (PAL) •MH-2 (stairstep) •Trigger slope (–) •SP mode •AUTO TRACKING OFF	1) Connect an oscilloscope to VIDEO OUT or TP310. 2) Play back the stairstep segment of MH-2 alignment tape. 3) Trigger the oscilloscope externally (– slope) with the signal from TP411 of the SERVO BOARD. 4) Adjust R421 to position the trigger point 6.5 ± 0.5H from V. sync.  OSCILLOSCOPE VIDEO OUT GND TP411 (Trigger)
		TP310 (VIDEO OUT) (MAIN BOARD)  6.5±0.5H V. Sync	R420 (NT SW POINT)	•PB (NTSC) •MH-1 (stairstep) •Trigger slope (–) •SP mode •AUTO TRACKING OFF	1) Connect an oscilloscope to VIDEO OUT or TP310. 2) Play back the stairstep segment of MH-1 alignment tape. 3) Trigger the oscilloscope externally (– slope) with the signal from TP411 of the SERVO BOARD. 4) Adjust R420 to position the trigger point 6.5 ±0.5 H from V. sync.  OSCILLOSCOPE VIDEO OUT GND TP411 (Trigger)

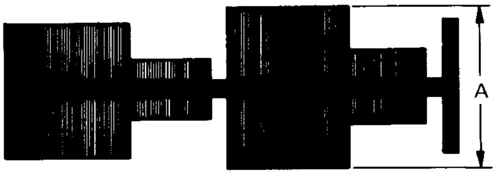
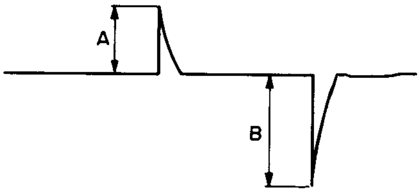
No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
2	PAL mode SP slow tracking preset	Monitor-TV	Presetting unit (PTU94008)	•SP mode •Slow PB •PAL mode	**Note:** ***Set VCR to A mode by remote controller.*** 1) Set recording video cassette into the cassette housing. 2) Receive a color broadcast on a VHF-HI channel or supply a color bar signal to VIDEO IN. 3) Record a color broadcast or color bar signal in the SP mode. 4) Play back recorded signal in the FWD slow mode and set the tracking control of the FRONT panel to the center position by simultaneously pressing the (+) and (−) tracking buttons. 5) Observe the display on a monitor-TV and adjust for optimum noise condition (best tracking) by depressing "B (−)" or "C (+)" buttons of presetting unit as required. 6) Depress the stop button on the FRONT panel. 7) Confirm that the bar noise is not visible on the monitor in the slow mode.
3	PAL mode LP slow tracking preset	Monitor-TV	Presetting unit (PTU94008)	•LP mode •Slow PB •PAL mode	1) In the same manner as the above SP slow mode.
4	NTSC mode SP slow tracking preset	Monitor-TV	Presetting unit (PTU94008)	•SP mode •Slow PB •NTSC mode	**Note:** ***Set VCR to A mode by remote controller.*** 1) Set recording video cassette into the cassette housing. 2) Receive a color broadcast on a VHF-HI channel or supply a color bar signal to VIDEO IN. 3) Record a color broadcast or color bar signal in the SP mode. 4) Play back recorded signal in the FWD slow mode and set the tracking control of the FRONT panel to the center position by simultaneously pressing the (+) and (−) tracking buttons. 5) Observe the display on a monitor-TV and adjust for optimum noise condition (best tracking) by depressing "B (−)" or "C (+)" buttons of presetting unit as required. 6) Depress the stop button on the FRONT panel. 7) Confirm that the bar noise is not visible on the monitor in the slow mode.
5	NTSC mode EP slow tracking preset	Monitor-TV	Presetting unit (PTU94008)	•EP mode •Slow PB •NTSC mode	1) In the same manner as the above SP slow mode.

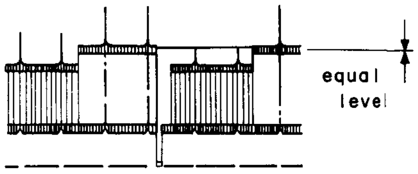
2.5 VIDEO CIRCUIT

Note: ***Unless otherwise specified, all test points and adjustments are located on the MAIN board.***

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Noise cancel balance	TP1 (IC1-26) (Video unit board)	R27 (NC BAL) (Video unit board)	• REC • Input sel: AUX • PAL colour bar • SP mode	1) Supply a colour bar signal to VIDEO IN and connect an oscilloscope to TP1 (IC1-26 pin). 2) Set for the Rec mode. Adjust R27 for minimum DC step difference.  Fig. 2-5-1
			R21 (NC BAL) (Video unit board)	• REC • Input sel: AUX • NTSC colour bar • SP mode	1) Supply a colour bar signal to VIDEO IN and connect an oscilloscope to TP1 (IC1-26 pin). 2) Set for the Rec mode. Adjust R21 for minimum DC step difference.
2	SP PB Frequency	VIDEO OUT (TP310)  3 scale 2.4-3 scale 100 kHz 1 MHz 2 MHz T : 2 ms/10 mV Fig. 2-5-2 PB frequency	R362 (SP PB EQ)	• REC then PB • CCIR video sweep • Auto tracking off • SP mode	1) Terminate VIDEO OUT with monitor - TV (75 Ω load), supply a video sweep signal without burst to VIDEO IN. 2) Set recording video cassette into the cassette housing. Record a video sweep signal without burst in the SP mode. 3) Connect an oscilloscope to VIDEO OUT. Play back recorded video sweep signal in the SP mode, set the tracking of the Front panel to the Auto tracking off position by simultaneously pressing the (+) and (–) tracking buttons. 4) Use the control of the oscilloscope to position the 100 kHz region at graduation 3 (0 dB) of the oscilloscope scale. 5) Adjust R362 to position the 2 MHz of channel 1 portion at 2.0 – 2.4 (–2 ± 1 dB) of the oscilloscope graduations as shown in Fig. 2-5-2. At this time, confirm that the channel difference is within 2 dB.
3	LP PB Frequency	VIDEO OUT (TP310)	R506 (LP PB EQ)	• REC then PB • Auto tracking off • CCIR video sweep • LP mode	1) In the same manner as above SP mode, perform adjustment for LP mode. 2) Record a video sweep without burst signal in the LP mode. 3) Play back recorded video sweep signal in the LP mode. Use the control of the oscilloscope to position the 100 kHz region at graduation 3 (0 dB) of the oscilloscope scale. 4) Adjust R506 to position the 2 MHz portion at 1.4 to 1.7 (–6±1 dB) of the oscilloscope graduations as shown in Fig. 2-5-2.
		Monitor	R362(SP) R506(LP)	• SP and LP modes • REC then PB • Philips pattern	**Alternate method:** 1) Record and play back a Philips pattern. 2) During playback, observe the picture and adjust R362 (SP mode) and R506 (LP mode) for the best resolution, whithout impaired S/N, at about 160 lines (2 MHz region). 3) So after this adjustment, confirm black or white spot.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
4	REC OUT-PUT BELL	TP305	LC101 (Rec output bell)  **Fig. 2-3-3** REC output	•SECAM colour bar •EE	1) Supply a colour bar signal to VIDEO IN, connect an oscilloscope to TP305. 2) Use the controls of the oscilloscope to expand portion waveform of the TP305 as shown in Fig. 2-3-3. 3) Adjust LC101 for equal magenta colour levels of both horizontal signals. 4) Trigger the oscilloscope externally with signal from TP312 (CN1-11: SYNC). T: 10 µs/10 mV
5	PB OUTPUT BELL	TP308	LC102 (PB output bell)  **Fig. 2-3-4** PB output	•SECAM colour bar •PB	1) Supply a colour bar signal to VIDEO IN, connect an oscilloscope to TP308. 2) Record a colour bar signal in the SP mode, then play back recorded colour bar signal. 3) Use the controls of the oscilloscope to expand portion waveform of the TP308 as shown in Fig. 2-3-4. 4) Adjust LC102 for equal magenta colour levels of both horizontal signals. 5) Trigger the oscilloscope externally with signal from TP231 (CN1-11: SYNC). T : 10 µs/10 mV
6	REC colour level	TP305	R311 (PAL Rec colour level)  **Fig. 2-5-5** PAL colour bar	•SP REC •PAL colour bar	1) Supply a colour bar signal to VIDEO IN. Connect an oscilloscope to TP305. 2) Set recording video cassette into the cassette housing. Set for the REC mode. 3) Adjust R311 so that the burst level becomes 34 ± 1 mVp-p at TP305 as shown in Fig. 2-5-5.
			R324 (SECAM Rec colour level)  **Fig. 2-5-6** SECAM colour bar	•SP REC •SECAM colour bar	4) Change colour bar signal to SECAM and supply the colour bar signal to VIDEO IN. 5) Trigger the oscilloscope externally with signal from TP312 (SYNC). 6) Adjust R324 so that the magenta level becomes 47 ± 1 mVp-p at TP305 as shown in Fig. 2-5-6.
			R319 (NTSC Rec colour level)  **Fig. 2-5-7** NTSC colour bar	•SP REC •NTSC colour bar	7) Change colour bar signal to NTSC and supply the colour bar signal to VIDEO IN. 8) Adjust R319 so that the burst level becomes 105 ± 2 mVp-p at TP305 as shown in Fig. 2-5-7.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
7	REC then PB colour level	TP207	R327	• PB mode • MH-2 colour bar • SP mode	1) Connect an oscilloscope to TP207 and observe colour signal level. 2) Set the MH-2 alignment tape into the cassette housing, play back the colour bar segment of MH-2 alignment tape. 3) Set the tracking of the FRONT panel to the Auto tracking off position by simultaneously pressing the "+" and "−" tracking buttons. 4) Adjust by pressing the "+" and "−" tracking buttons of the Front panel for maximum level of the colour waveform and make a note of the higher colour level "A". 5) Press the STOP button on the FRONT panel and eject the MH-2 alignment tape.
	 Fig. 2-5-8 REC color level			• REC then PB • PAL colour bar • Auto tracking : OFF • SP mode	6) Set recording video cassette into the cassette housing. Supply a colour bar signal to VIDEO IN. 7) Trigger the oscilloscope externally with the signal from TP411 (DRUM FF) of the Servo board. Use (−) trigger for CH1 and (+) trigger for CH2. 8) Record a colour bar signal in the SP mode. 9) Play back recorded colour bar signal. Set the tracking of the FRONT panel to the Auto tracking off position by simultaneously pressing the "+" and "−" tracking buttons and confirm 85 ± 3% of the noted colour level at TP207. If necessary, before recording, adjust R327 so that the higher level channel becomes 85 ± 3% of the noted level "A" during playback as shown in Fig. 2-5-8. At this time, confirm that the channel level difference is within 5 dB. **Note:** ***Repeat the above step (9) several times.***
8	LP REC Colour Level and Balance	TP207	R504	• PB mode • MH-2L colour bar • REC then PB • PAL colour bar • LP mode • AUTO TRACKING OFF	1) Short between TP404 and GND of the servo board. 2) In the same manner as above (2.5.7), adjust R504 so that the higher level channel becomes 85±3% of the noted level during play back. At this time, confirm that the channel difference is within 4 dB.
9	Secam det	TP114	L104	• EE • SECAM colour bar	1) Connect an oscilloscope to TP114. 2) Adjust L104 so that A and B are related as follows: A : B = 3 : 3.8±0.2  **Fig. 2-5-9**
10	Mesecam det	TP214	L207	• EE • SECAM colour bar	1) Connect an oscilloscope to TP214. 2) Adjust L207 so that A and B are related as follows: A : B = 3 : 3.8±0.2 as shown in Fig. 2-5-9.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
11	Delayed colour level	TP308 TP316	R514	•PAL colour bar •SP •REC then PB	1) Connect one channel of a dual trace oscilloscope to TP308 and the other channel to TP316. 2) Adjust R514 so that TP308 and TP316 become the same colour level.
12	Delayed video level	TP310 (VIDEO OUT)	R9 (Inc. IC501)	•NTSC colour bar •SP •REC then PB ↓ STILL	1) Connect an oscilloscope to TP310 (VIDEO OUT). 2) Record a colour bar signal in the SP mode, then play back in the still mode. 3) Adjust R9 so that the Y level difference is uniform at VIDEO OUT as show in Fig. 2-5-10.  Fig. 2-5-10
13	0.5H Jump det.	TP331	R410	•E-E •No signal	1) Connect a frequency counter between TP331 and GND. 2) Short between TP332 and TP333. 3) Adjust R410 for 30.0±0.2 kHz.

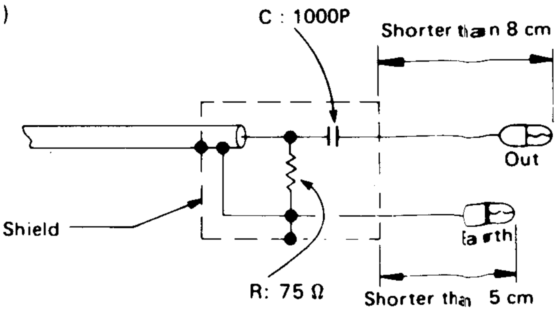
2.6 AUDIO CIRCUIT

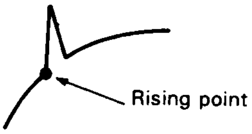
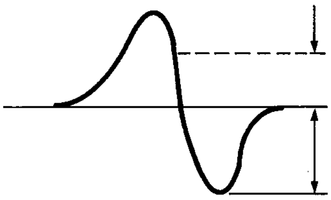
Note: ***Unless otherwise specified, all test points and adjustments are located on the MAIN board.***

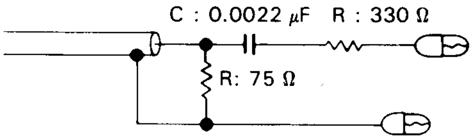
No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Audio Bias Level	TP31 (+) TP32 (−)	R42	•SOURCE Select: AUX •SP mode •REC mode •No signal	1) Connect a millivoltmeter between TP31 and TP32. 2) Set for the REC mode without incoming signal. 3) Adjust R42 for 1.9 mVrms.

2.7 TUNER/IF CIRCUIT

Note: ***Unless otherwise specified, all test points and adjustments parts are located on the IF and TUNER CTL board.***

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
Equipment required: 1. Oscilloscope 2. IF sweep signal generator with suitable markers (PIF, SIF, etc.) 3. DC power supplies – For power bias (12.0 V) – For IF AGC bias (approx. 5 V variable) 4. Sweeper probe (sweep signal supply cable) as shown below.  C : 1000P Shorter than 8 cm Out Shield Earth R: 75 Ω Shorter than 5 cm Sweeper probe Fig. 2-7-1					

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	LLD Coil	Pin 27 of IC1  Fig. 2-7-2	T5	• Sweeper generator out: 45 dBμ • Tuner mode	1) Use sweeper probe as shown in Fig. 2-7-1 and connect the sweep generator output to pin 8 of IC1. 2) Adjust the sweep gain so that the waveform does not distort as observed with the oscilloscope. Connect DC power supply to pin 4 of IC1 and adjust it to obtain 2.0 Vp-p at pin 27 of IC1. 3) Adjust T5 (LLD coil) so that the rising commponent of the 38.9 MHz marker becomes maximum level.
2	AFC coil	Pin 22 of IC1  Fig. 2-7-3	T4	• Sweeper generator out: 45 dBμ • Tuner mode	1) Same as above condition. 2) Apply DC voltage to pin 4 of IC1 which does not saturate the output of pin 22 of IC1. 3) Adjust T4 to obtain waveform as left.
3	SOUND TRAP (1)	Q6-C	T2	• Sweep generator out: 90 dBμ • Tuner mode	1) Use sweeper probe as shown in Fig. 2-7-1 and connect sweep generator out put (33.4 MHz, unmodulated, 90 dBμ/75 Ω) to JP1-2. 2) Connect oscilloscope to Q6-C. Adjust T2 so that the carrier waveform is minimum level.
				• TV broadcast • Tuner mode	**Alternate method:** 1) Receive a colour broadcast on a VHF channel. 2) Adjust T2 for maximum level at audio sound.
4	SOUND TRAP (2)	Q6-C	T3	• Sweep generator out: 90 dBμ • Tuner mode	1) Use sweeper prove as shown in Fig. 2-7-1 and connect sweep generator out put (32.40 MHz, unmodurated, 80 dBμ/75 Ω) to JP1-2. 2) Connect oscilloscope to Q6-C. Adjust T3 so that the carrier waveform is minimum level.
5	S LLD	Pin 11 of IC1 (SIF board)	T1 (SIF board)	• Sweep generator out: 80 dBμ • Tuner mode	1) use sweeper probe as shown in Fig. 2-7-1 and connect sweep generator output (38.9 MHz, 1 kHz/60% modulated, 80 dBμ/75 Ω, AM MOD) to pin 1 of IC1. 2) Connect distortion-meter to pin 11 of IC1 and observe audio signal. Adjust T1 so that the distortion becomes minimum (less than 2.0%)
				• TV broadcast • Tuner mode	**Alternate method:** 1) Receive a colour broadcast on a VHF channel. Connect oscilloscope to IC1-11 of the SIF board. 2) Adjust T1 for maximum level at audio sound.
6	Detector (1)	Pin 10 of IC4 (SIF board)	T3 (SIF board)	• TV broadcast • Tuner mode	1) Receive a broadcast with european channel (UHF). 2) Set the oscilloscope to DC mode and adjust T3 of the SIF board for 6.00±0.05 V.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
7	Detector (2)	Pin 1 of IC6	T4 (SIF board)	•TV broadcast •Tuner mode	1) Receive a broadcast with european channel (UHF). 2) Set the oscilloscope to DC mode and adjust T4 of the SIF board for 5.00±0.05 V.
8	Trap	Pin 2 of JP1	T1 (TUNER/CTL board)	•Sweep generator out: 90 dBμ •Tuner mode	1) Use sweeper probe as show in Fig. 2-7-1 and connect the sweep generator output to IF terminal. 2) Adjust T1 to obtain minimum waveform at pin 2 of JP1.
9	OSC	Pin 2 of JP1	L5 (Tuner/CTL board)	•Sweep generator •Tuner mode	1) Connect oscilloscope to Pin 2 of JP1. 2) Adjust L5 so that 71.88 MHz marker becomes maximum level.
				•TV broadcast •Tuner mode	**Altenate method:** 1) Receive a colour broadcast on a VHF channel. 2) Adjust L5 to obtain a fine picture on the monitor.
10	DBM BAL	Pin 2 of JP1  Fig. 2-7-4	R18 (TU/CTL board)	•Sweep generator out: 100 dBμ •Tuner mode	1) Use sweeper probe as shown in Fig. 2-7-4 and connect sweep generator output (39.5 MHz, unmodulated, 100 dBμ/75 Ω) to IF terminal. 2) Connect oscilloscope to Pin 2 of JP1. 3) Adjust R18 so that the carrier waveform of 39.5 MHz is minimum level (less than 45 dBμ). **Note:** ***For ordinary service, it may be adequate to simply observe the TV-monitor picture and adjust for absence of beat.***
				•TV broadcast •Tuner mode	**Altenate method:** 1) Receive a colour broadcast on a VHF channel. 2) Adjust R18 for absence of beat on the monitor.

Before the following adjustments;
1. Connect a cable to ANT IN and terminate TV out at 75 Ω.
2. Set a TV channel signal generator as follows.

Video: 70 dBμ/75 Ω, colour bar 87.5% modulation
Audio: 63 dBμ/75 Ω, 1 kHz±25 kHz deviation

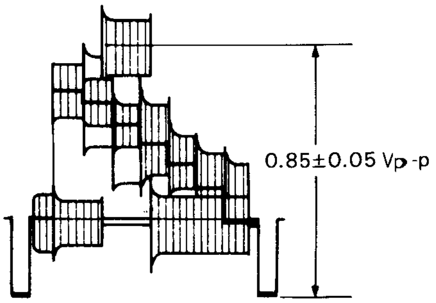
(NTSC)

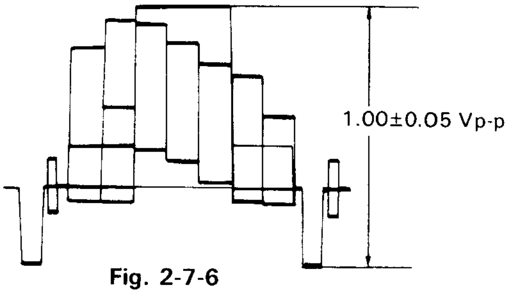
Video: 70 dBμ/75 Ω, colour bar 95% modulation
Audio: 60 dBμ/75 Ω, 1 kHz 80% modulation

(SECAM)

Video: 70 dBμ/75 Ω colour bar 87.5% modulation
Audio: 60 dBμ/75 Ω 1 kHz±50 kHz deviation

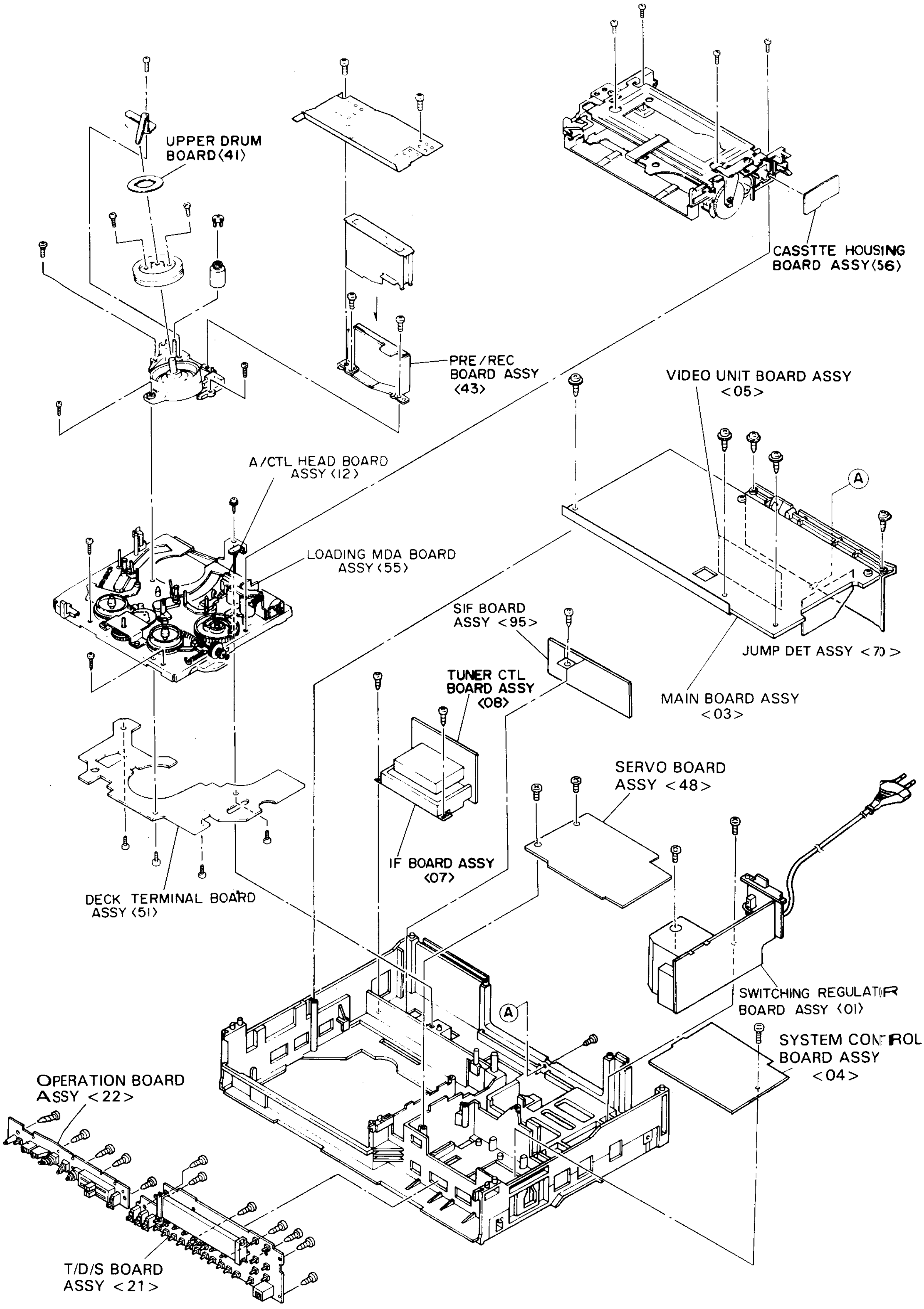
(PAL)

11	Y Level (SECAM)	Pin 2 of CN2 (video out, TNR CTL board)	R31 (IF board)	•TV signal (SECAM) •Colour bar	1) Connect oscilloscope to CN2 pin 2 of TNR CTL board and observe Y level signal. Adjust R31 for 0.85±0.05 Vp-p as shown in Fig. 2-7-5.  Fig. 2-7-5
				•TV broadcast •Tuner mode	**Alternate method:** 1) Receive a colour broadcast on a VHF channel. 2) Adjust R31 so that the magenta level becomes 2/3% of the sync. level.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
12	Y level (PAL)	Pin 2 of CN2 video out (TNR CTL board)	R70 (IF board)	• TV signal (PAL) • Colour bar	1) Receive a PAL colour bar signal. Adjust R70 to obtain 1.00±0.05 Vp-p as shown in Fig. 2-7-6.  Fig. 2-7-6
				• TV broadcast • Tuner mode	**Alternate method:** 1) Receive a colour broadcast on a VHF channel. 2) Adjust R70 so that the magenta level becomes 2/3% of the sync. level.
13	RF AGC	IF terminal of Front end	R36 (RF AGC) (IF board)	• TV signal • Tuner mode	1) Connect the oscilloscope to IF terminal of U/V Tuner (Front end). Adjust R36 for maximum level, then again adjust R36 for –7 dB again.
		MONITOR	R36 (RF AGC) (IF board)	• TV broadcast • Tuner mode	**Alternate method:** Note:***Adjust R36 (RF AGC) to correct for excess noise in the picture or when streaky cross interference osccurs due to strong electrical fields.*** 1) Adjust R36 to minimize noise or streaks on the TV screen. 2) Check for absence of abnormality on all channels.
14	SECAM DISTORTION	Pin 5 of CN2 (TUNER/CTL board)	R27 (SIF board)	• TV signal • Tuner mode	1) Receive a SECAM colour broadcast. 2) Connect a distortion meter to pin 5 of CN2. 3) Adjust R27 for minimum distortion (less than 2%).
15	Audio level	Pin 5 of CN2 (TUNER/CTL board)	R16 (SECAM Audio level) (SIF board)	• TV signal (SECAM) • Tuner mode	1) Supply SECAM RF signal to the unit. 2) Connect an audio tester to pin 5 of CN2. 3) Adjust R16 to obtain –17 dBs audio level.
			R86 (PAL Audio level) (SIF board)	• TV signal (PAL) • Tuner mode	1) Supply PAL RF signal to the unit. 2) Connect an audio tester to pin 5 of CN2. 3) Adjust R86 to obtain –14 dBs audio level.
			R85 (NTSC audio level) (SIF board)	• TV signal (NTSC) • Tuner mode	1) Supply NTSC RF signal to the unit. 2) Connect an audio tester to pin 5 of CN2. 3) Adjust R85 to obtain –17 dBs audio level.

SECTION 3
CHARTS AND DIAGRAMS

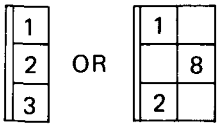
3.1 CIRCUIT BOARD LOCATIONS


UPPER DRUM BOARD(41)
CASSTTE HOUSING BOARD ASSY(56)
PRE/REC BOARD ASSY <43>
VIDEO UNIT BOARD ASSY <05>
A/CTL HEAD BOARD ASSY (12)
A
LOADING MDA BOARD ASSY (55)
SIF BOARD ASSY <95>
JUMP DET ASSY <70>
TUNER CTL BOARD ASSY <08>
MAIN BOARD ASSY <03>
SERVO BOARD ASSY <48>
IF BOARD ASSY <07>
DECK TERMINAL BOARD ASSY (51)
SWITCHING REGULATOR BOARD ASSY (01)
A
SYSTEM CONTROL BOARD ASSY <04>
OPERATION BOARD ASSY <22>
T/D/S BOARD ASSY <21>

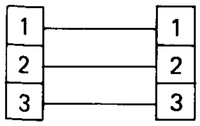
3.2 GENERAL INFORMATION

3.2.1 Connections

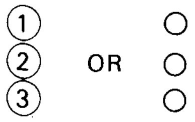
Note:
Unless otherwise specified, only signal input flow is indicated.
Connection arrows indicate only signal outputs.



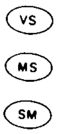
: Connectors



: Board in connectors



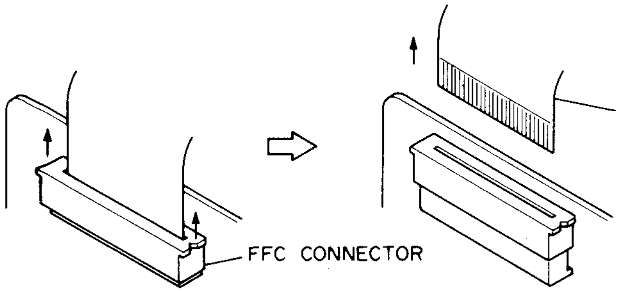
: Direct connections



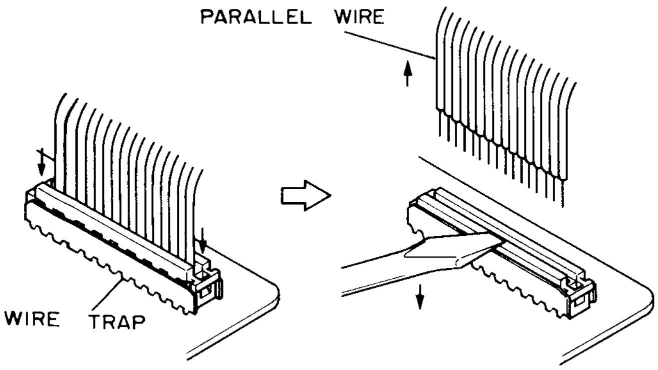
: Connected pattern in the board.
Abbreviations
V : Video M : Mechacon
S : Servo A : Audio
VS : Signal flow from video to servo.

3.2.2 Disconnecting the flatwire

1. Pull the connector structure upward to release the clamp when removing or inserting the flat wire cable.

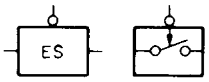


2. Depress the connector structure downward to release the clamp when removing or inserting the flat wire cable, as indicated below.

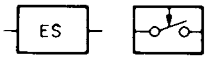


3.2.3 Indications

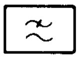
AUX : Active only at high.
$\overline{AUX}$: Active only at low.
$\bar{A}\bar{U}\bar{X}$: Active only at middle.
$\bar{A}U\bar{X}$: Active only at open.



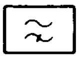
: Active only at low for electronic switch.



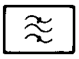
: Active only at high for electronic switch.



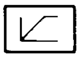
: Low pass filter.



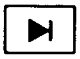
: High pass filter.



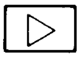
: Band pass filter.



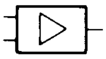
: Limiter.



: Detector.



: Amplifier.



: Mixer stage.

3.2.4 Schematic diagram values

Unless otherwise specified.

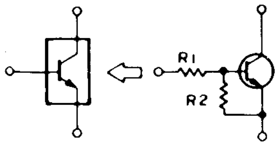
1. All resistance values are in ohms, 1/6 W or 1/8 W (refer to parts list).
2. All capacitance values are in μF, (P; PF).
3. All inductance values are in μH, (m; mH).
4. All diodes are 1SS133 or MA165, (refer to parts list).
5. Voltages are DC-measured (reference to ground) with a digital voltmeter during recording (SP mode) and playback (SP mode) with alignment tape. Where voltages differ between recording and playback, the voltage during playback is shown in parenthesis.
6. Waveforms (VIDEO System) are measured (reference to ground) with a color bar during recording (SP mode) and playback (SP mode) with alignment tape.
7. Waveforms (AUDIO System) are measured (reference to ground) with 1 kHz (−8 dBs) during recording and playback with alignment tape (1 kHz).
8. Shaded (▨) parts are critical for safety.
   Replace only with specified part numbers.

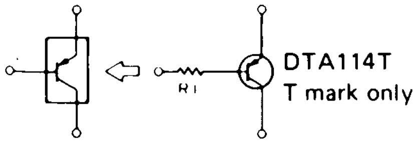
3.2.5 Signal flow in the schematic

➡ Recording signal path
⇨ Playback signal path
⇾ REC/PB signal path

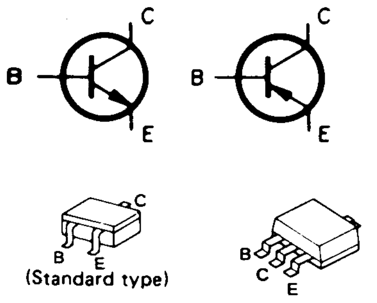
3.2.6 Semiconductors

1. Digital transistor

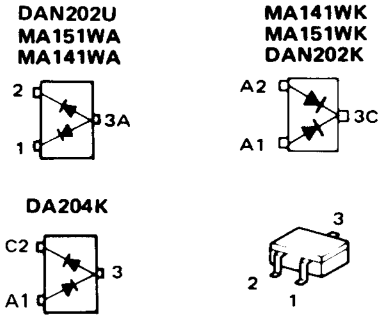



R1
DTA114T
T mark only

2. Chip transistor


C
B
E
C
B
E
C
B
E
(Standard type)
B
C
E

3. Chip diode


DAN202U
MA151WA
MA141WA
2
1
3A
MA141WK
MA151WK
DAN202K
A2
A1
3C
DA204K
C2
A1
3
3
2
1

Note:
The digital transistor includes built in resistors.
It features small size and high reliability.
Both PNP and NPN types are available.

Uses:
Inverter, Interface, driver circuits.

3.2.7 Replacement of chip parts

For replacing chip parts, proceed as follows.
Use a well insulated fine-tipped soldering iron (approx. 17 W, 130°C ~ 260°C in temp.).
In addition, it is recommended to use a soldering iron (55 W approx.) with solder absorber for convenience.

Caution:
- Do not apply heat for more than 3 seconds.
- Do not rub electrodes.
- Do not reuse chips removed once. Discard them.
- Supplementary cementing is not required.

1. Soldered condition of chip parts

- Resistors, capacitors, etc.

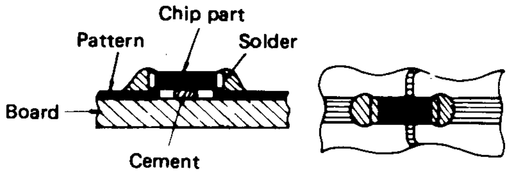

Chip part
Pattern
Solder
Board
Cement

Fig. 1-1 Soldering condition-1

- Transistors, diodes, etc.

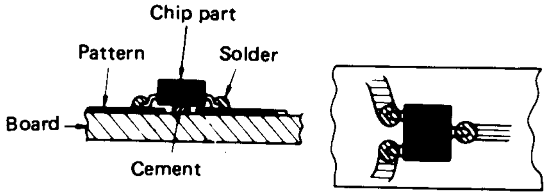

Chip part
Pattern
Solder
Board
Cement

Fig. 1-2 Soldering condition-2

2. How to remove chip parts

- Resistors, capacitors, etc.

1) Place a chip parts removal tool onto the chip part to hold it down.
2) Unsolder at each side of the chip part.

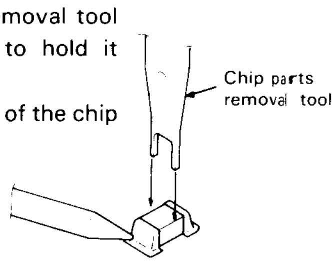

Chip parts removal tool

Fig. 2-1 R/C removal-1

3) Remove the chip part by twisting and sliding it.

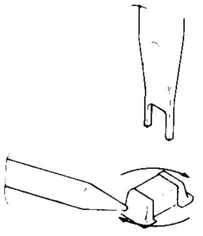


Fig. 2-2 R/C removal-2

3. How to remove transistors, diode.

1) Unsolder at the single lead side of the chip part.

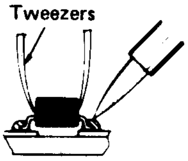


Fig. 3-1 Tr/Diode removal-1

2) Lift the unsoldered side upwards.

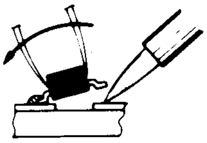


Fig. 3-2 Tr/Diode removal-2

3) Heat the other two leads simultaneously and remove the chip part upwards.

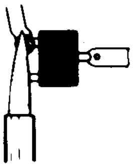


Fig. 3-3 Tr/Diode removal-3

4. Preheating and soldering

When placing new chip parts, especially capacitors, but not including transistors, preheat them with hot air (150°C approx.) by use of a blower type of hair dryer for about 2 minutes just before soldering. For soldering, use a soldering iron of 30 W approx.

5. How to place and solder chip parts

1) Presolder the contact points of the circuit pattern, to which the chip parts will be soldered.

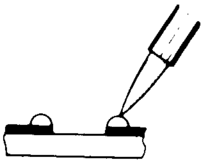


Fig. 5-1 Soldering-1

2) While holding down the chip part with the chip part removal tool, solder it with a soldering iron.

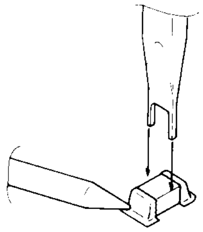
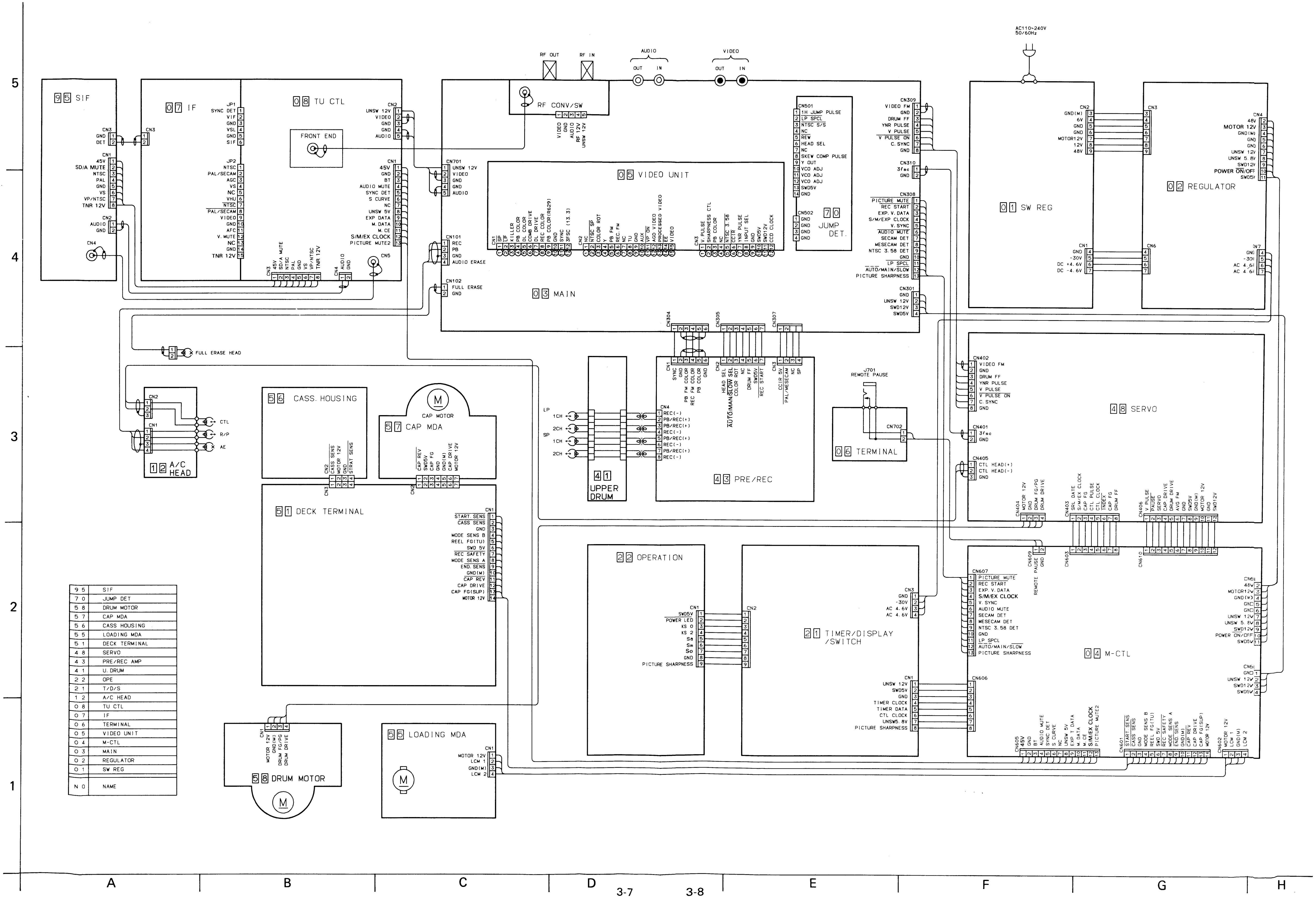


Fig. 5-2 Soldering-2

3.3 KEY TO ABBREVIATIONS

A	AC	: Alternating Current
	ACC	: Automatic Color Control
	ACCEL	: Acceleration
	A/CTL	: Audio/Control
	ADC	: Analog to Digital Converter
	ADD	: Adder
	ADRS	: Address
	ADJ	: Adjustment
	A DUB	: Audio Dubbing
	AE	: Audio Erase
	AEF	: Automatic Editing Function
	AFC	: Automatic Frequency Control
	AFT	: Automatic Fine Tuning
	AGC	: Automatic Gain Control
	AH	: Audio Head
	AL	: After Loading
	ALC	: Automatic Light Compensation Automatic Level Control
	AM	: Amplitude Modulation
	AMP	: Amplifier
	ANT	: Antenna
	APC	: Automatic Pedestal Control Automatic Phase Control
	APL	: Average Picture Level
	A/S/M	: Audio/Servo/Mechacon
	ASS'Y	: Assembly
	ATT	: Attenuator
	AUD	: Audio
	AUTO	: Automatic
	AUX	: Auxiliary
B	B	: Base
	BAL	: Balance
	BATT	: Battery
	BFP	: Burst Flag Pulse
	BIT	: Binary Digit
	BLK	: Black, Blanking
	BLU	: Blue
	BILING	: Bilingual
	BPF	: Bandpass Filter
	BRK	: Brake
	BRN	: Brown
	BT	: Band Tuning
	BUFF	: Buffer
	BW or B/W	: Black and White
C	C	: Capacitance, Collector, Color
	CAP	: Capstan, Capacitor
	CAR	: Carrier
	CARR	: Carrier
	CASS	: Cassette
	CCD	: Charge Coupled Device
	CCT	: Circuit
	CD	: Count Down
	CE	: Chip Enable
	CF	: Ceramic Filter
	CH	: Channel
	CHG	: Charge
	CHROMA	: Chrominance
	CLK	: Clock
	CLR	: Clear
	CMD	: Command
	CNT	: Count, Counter
	COL	: Color
	COM	: Common
	COMB	: Combination Comb Filter
	COMP	: Comparator Composite Compensation
	CONN	: Connector
	CONV	: Converter
	CP	: Circuit Protector Clamp Pulse
	CPC	: Capstan Phase Control
	CTL	: Control
D	D	: Drum, Digital, Diode, Drain
	DAC	: Digital to Analog Converter
	dB	: Decibel
	DC	: Direct Current
	DEC	: Decoder
	DEMOD	: Demodulator
	DEMUX	: Demultiplexer
	DET	: Detector
	DEV	: Deviation
	DIF	: Differential
	DISCR	: Discriminator
	DL	: Delay Line
	DOC	: Dropout Compensator
	DOD	: Drop Out Detector
	DPC	: Drum Phase Control
E	E	: Edit, Emitter
	EE	: Electric to Electric
	EF	: Emitter-Follower
	EMP	: Emphasis
	EN	: Enable
	ENC	: Encoder
	ENV	: Envelope
	EP	: Extended Play
	EQ	: Equalizer
	ES	: Electronic Switch
	ESNS	: End Sensor
	EXP	: Expander
	EXT	: External
F	F	: Farad, Fuse
	F ADV	: Frame Advance
	FDP	: Fluorescent Display Panel
	FE	: Full Erase
	FET	: Field Effect Transistor
	FF	: Fast Forward Flipflop
	FG	: Frequency Generator
	FM	: Frequency Modulation
	FMA	: FM Audio
	FR	: Full Recording, Frame, Fusible Resistor
	FREQ	: Frequency
	F-V CONV	: Frequency to Voltage Converter
	FWD	: Forward
	FWD S	: Forward Search
G	G	: Green, Gate, Grid
	GEN	: Generator
	GND	: Ground
	GRN	: Green
	GRY	: Gray
H	H	: High, Henry, Hour
	HG	: Hall Generator
	HPF	: Highpass Filter
	Hz	: Hertz
I	IC	: Integrated Circuit
	ID	: Identification (Pulse)
	IF	: Intermediate Frequency
	IFR	: Infrared
	IFT	: Intermediate Frequency Transformer
	IND	: Indicator
	INH	: Inhibit
	INS	: Insert
	INT	: Internal, Interrupt
	INV	: Inverter
	I/O	: Input/Output
	IR	: Infrared
L	L	: Low, Left
	LIM	: Limiter
	LIN	: Linearity
	LOAD	: Loading (Cassette)
	LP	: Long Play
	LPF	: Lowpass Filter
M	M	: Motor, Mega
	MAX	: Maximum
	MDA	: Motor Drive Amplifier
	MECHACON	: Mechanism Control
	MI	: Multiintroduce
	MIC	: Microphone
	MIN	: Minimum
	MIX	: Mixer, Mixing
	MMV	: Monostable Multivibrator
	MOD	: Modulation, Modulator
	MODEM	: Modulator-Demodulator
	MON	: Monitor
	MPX	: Multiplexer, Multiplex
	MS	: Mode Select
N	NAND	: Not-And
	NC	: Not Connected, Normally Closed
	NFB	: Negative Feedback
	NLN	: Non-Linear
	NO	: Normally Open
	NOR	: Normal, Not-Or
	NR	: Noise Reduction
O	OP	: Operation
	OPAMP	: Operational Amplifier
	ORN	: Orange
	OSC	: Oscillator
P	PB	: Playback
	PC	: Photocoupler, Pulse Counter
	PCM	: Pulse Code Modulation
	PG	: Pulse Generator
	PGM	: Program
	PI	: Photo Interrupter
	PIF	: Picture Intermediate Frequency
	PLA	: Programmable Logic Array
	PLL	: Phase Locked Loop
	POS	: Position
	p-p	: Peak-to-Peak
	PREAMP	: Preamplifier
	P/S	: Pause/Still
	PSC	: Pulse Swallowing Control
	PU	: Pickup
	PUT	: Programmable Unijunction Transistor
	PWM	: Pulse Width Modulation
	PWR	: Power
Q	Q	: Quality Factor
R	R	: Red, Right
	RA	: Resistor Array
	RAE	: Random Access Enable
	RAM	: Random Access Memory
	REC	: Recording
	REF	: Reference
	REG	: Regulated, Regulator
	REM	: Remote
	REMOCON	: Remote Control (Unit)
	REV	: Reverse
	REV S	: Reverse Search
	REW	: Rewind
	R/P	: Record/Playback
	RPT	: Repeat
	RST	: Reset
	RT	: Rotary Transformer
	RUN	: Running
	RY	: Relay
S	SAW	: Sawtooth, Surface Acoustic Wave
	SC	: Subcarrier, Simulcast
	SCH	: Search
	SEL	: Select, Selector
	SENS	: Sensor
	SEP	: Separator
	SF	: Source Follower
	SFF	: Short Fast Forward
	SIF	: Sound Intermediate Frequency
	SHARP	: Sharpness
	SN	: Signal to Noise Ratio
	SOL	: Solenoid
	SP	: Standard Play
	SREV	: Search Reverse
	SREW	: Short Rewind
	S/S	: Slow/Still
	SSG	: Sync Signal Generator
	SSNS	: Start Sensor
	STD	: Strobe Data, Standard
	SUP	: Supply
	SW	: Switch
	SWD	: Switched
	SYNC	: Synchronization
T	TF	: Thermal Fuse
	TIM	: Timing
	TK	: Tracking
	TNR	: Tuner
	TP	: Test Point
	TPZD	: Trapezoid
	TR	: Transistor, Trimmer
	TRANS	: Transformer
	TU	: Take-up
U	UL	: Unloading
	UNREG	: Unregulated
	UNSW	: Unswitched
V	V	: Vertical, Volt
	VCO	: Voltage Controlled Oscillator
	VD	: Vertical Drive
	VIF	: Video Intermediate Frequency
	VLT	: Violet
	VR	: Variable Resistor
	VS	: Video and Sync
	V/T	: Video/Television
	V/U	: VHF/UHF
	VXO	: Variable Crystal Oscillator
W	W	: Watt
	W & D	: White and Dark
	WHT	: White
X	XTAL	: Crystal
Y	Y	: Luminance
	YEL	: Yellow

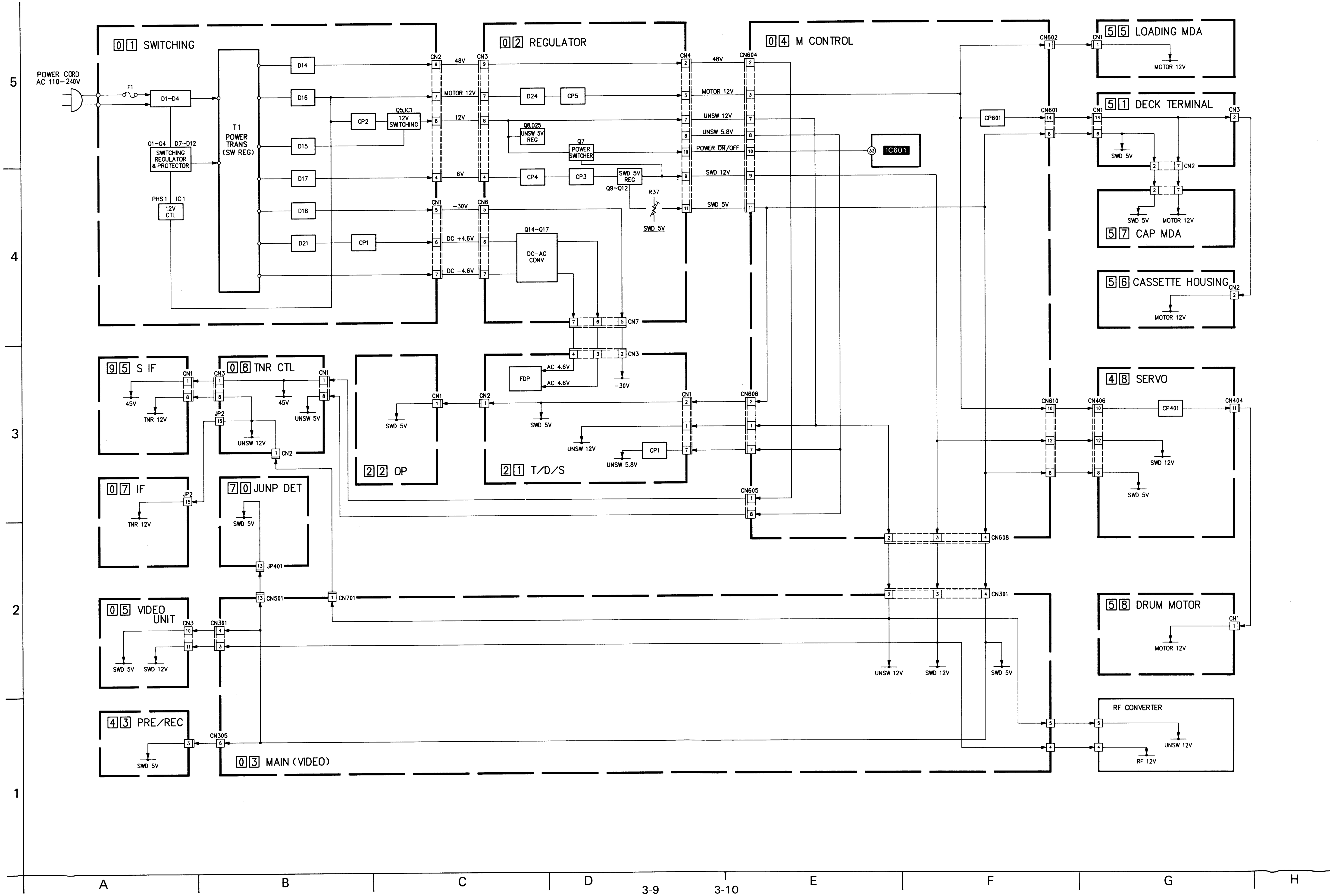
3.4 BOARD INTERCONNECTIONS



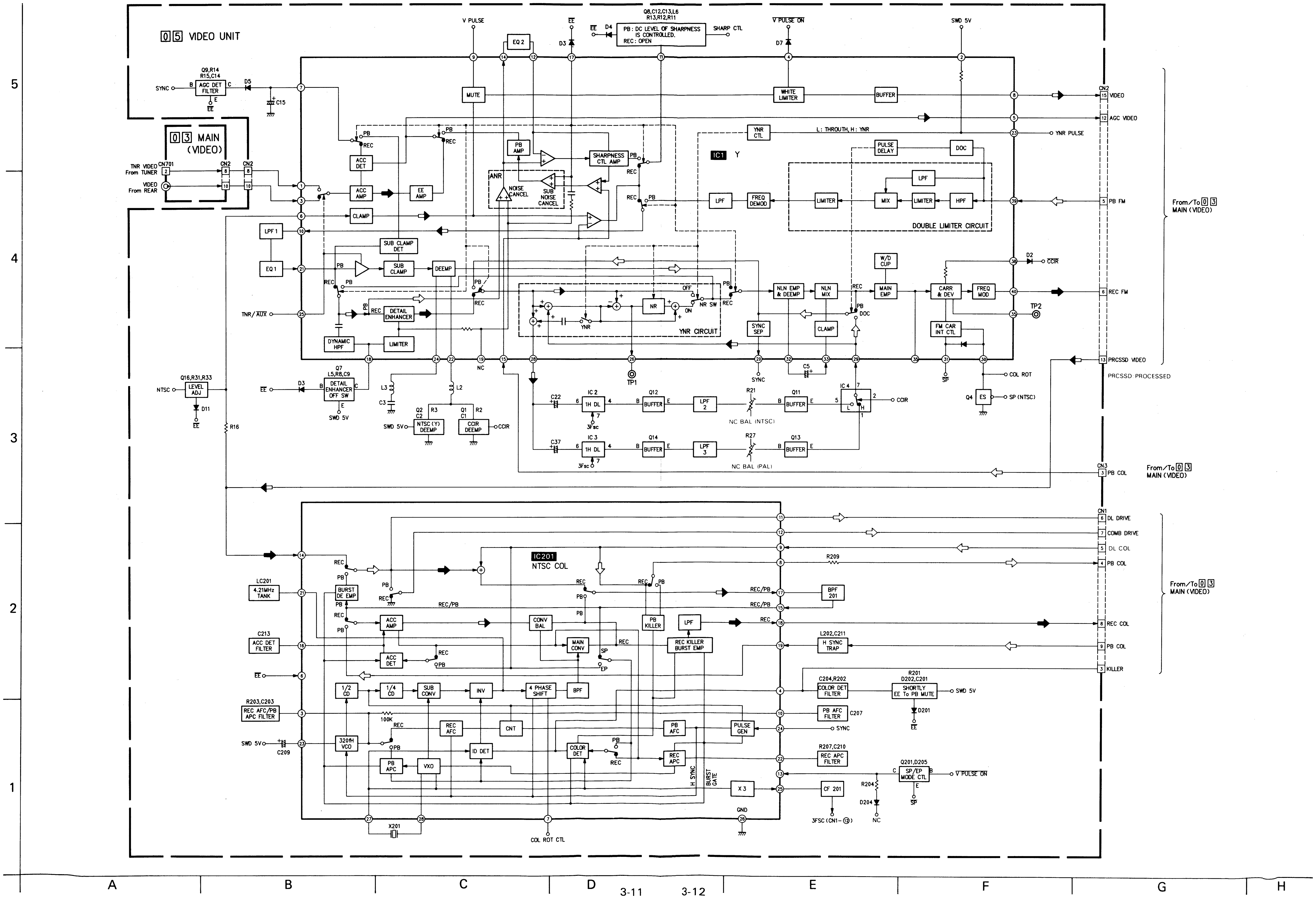
5
4
3
2
1
A
B
C
D
E
F
G
H
95 SIF
07 IF
08 TU CTL
FRONT END
RF OUT
RF IN
AUDIO
OUT IN
VIDEO
OUT IN
RF CONV/SW
05 VIDEO UNIT
03 MAIN
70 JUMP DET.
AC110~240V 50/60Hz
01 SW REG
02 REGULATOR
FULL ERASE HEAD
12 A/C HEAD
CTL
R/P
AE
56 CASS. HOUSING
CAP MOTOR
57 CAP MDA
51 DECK TERMINAL
41 UPPER DRUM
LP
SP
1CH
2CH
43 PRE/REC
J701 REMOTE PAUSE
06 TERMINAL
48 SERVO
22 OPERATION
21 TIMER/DISPLAY /SWITCH
04 M-CTL
58 DRUM MOTOR
55 LOADING MDA
CN1
CN2
CN3
CN4
CN5
CN6
CN7
JP1
JP2
CN101
CN102
CN301
CN304
CN305
CN307
CN308
CN309
CN310
CN401
CN402
CN403
CN404
CN405
CN406
CN501
CN502
CN601
CN602
CN603
CN605
CN606
CN607
CN609
CN610
CN701
CN702
UNSW 12V
VIDEO
GND
AUDIO
45V
SD/A MUTE
NTSC
PAL
VS
VP/NTSC
TNR 12V
SYNC DET
VIF
VSL
SIF
PAL/SECAM
AGC
NC
VHU
AFC
V. MUTE
AUDIO MUTE
BT
S CURVE
EXP DATA
M. DATA
M. CE
S/M/EX CLOCK
PICTURE MUTE2
REC
PB
AUDIO ERASE
FULL ERASE
VIDEO FM
DRUM FF
YNR PULSE
V PULSE
V PULSE ON
C. SYNC
3fsc
PICTURE MUTE
REC START
EXP. V. DATA
S/M/EXP CLOCK
V. SYNC
SECAM DET
MESECAM DET
NTSC 3.58 DET
LP SPCL
AUTO/MAIN/SLOW
PICTURE SHARPNESS
SWD12V
SWD5V
1H JUMP PULSE
NTSC S/S
REW
HEAD SEL
SKEW COMP PULSE
Y OUT
VCO ADJ
GND(M)
6V
MOTOR12V
12V
48V
-30V
DC +4.6V
DC -4.6V
MOTOR 12V
UNSW 5.8V
POWER ON/OFF
AC 4.6V
REC(-)
PB/REC(+)
PB FM COLOR
REC FM COLOR
PB COLOR
HEAD SEL
AUTO/MAN/SLOW SEL
COLOR ROT
SWD5V
REC START
CC1R 5V
PAL/MESECAM
SP
CTL HEAD(+)
CTL HEAD(-)
START SENS
CASS SENS
STRAT SENS
MODE SENS B
REEL FG(TU)
SWD 5V
REC SAFETY
MODE SENS A
END. SENS
CAP REV
CAP DRIVE
CAP FG(SUP)
CAP FG
DRUM FG/PG
DRUM DRIVE
LCM 1
LCM 2
POWER LED
KS 0
KS 2
Sa
Sm
So
TIMER CLOCK
TIMER DATA
CTL CLOCK
UNSW5.8V
REMOTE PAUSE

N O	NAME
9 5	SIF
7 0	JUMP DET
5 8	DRUM MOTOR
5 7	CAP MDA
5 6	CASS HOUSING
5 5	LOADING MDA
5 1	DECK TERMINAL
4 8	SERVO
4 3	PRE/REC AMP
4 1	U. DRUM
2 2	OPE
2 1	T/D/S
1 2	A/C HEAD
0 8	TU CTL
0 7	IF
0 6	TERMINAL
0 5	VIDEO UNIT
0 4	M-CTL
0 3	MAIN
0 2	REGULATOR
0 1	SW REG

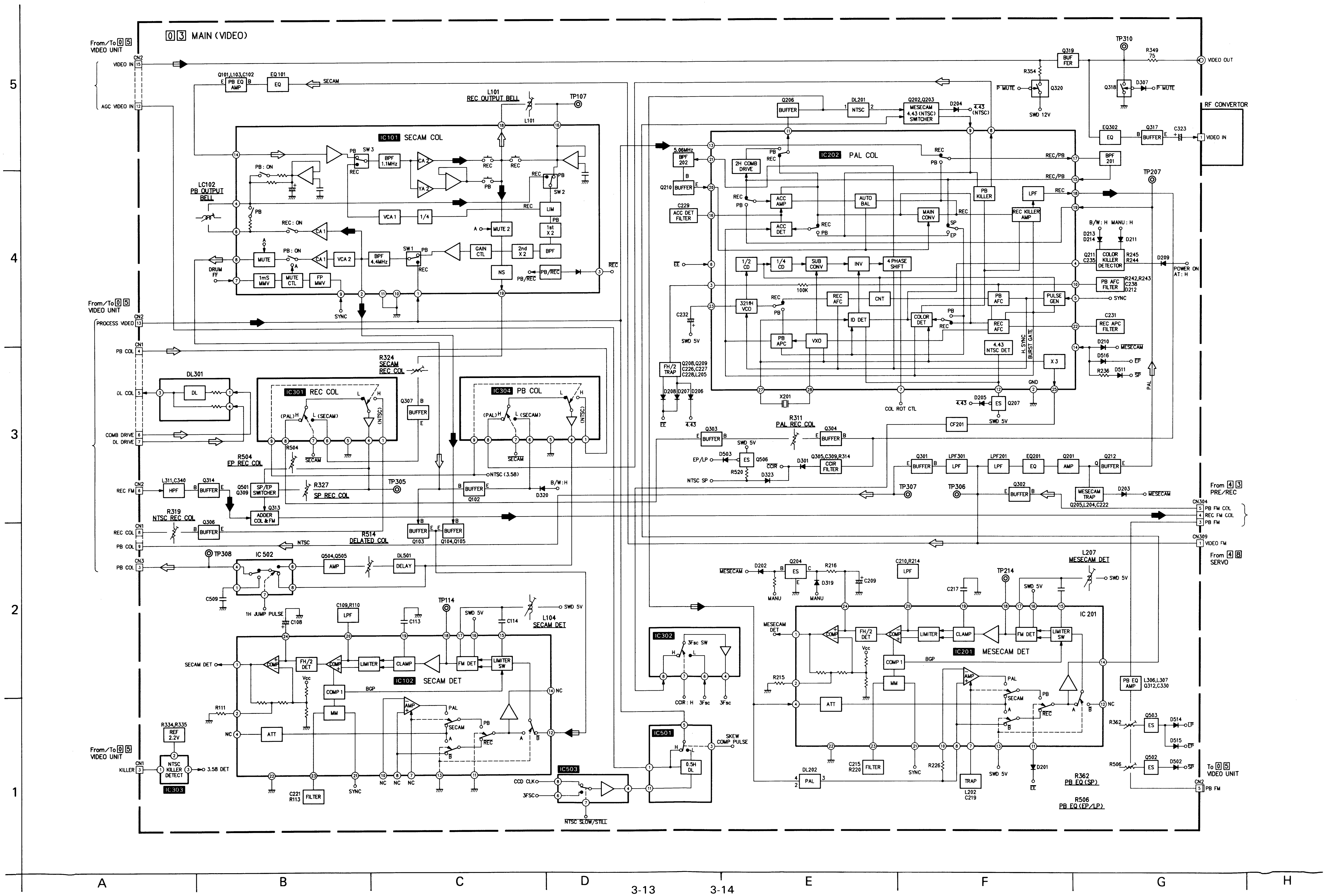
3.5 POWER SYSTEM BLOCK DIAGRAM


0 1 SWITCHING
POWER CORD AC 110−240V
F1
D1~D4
Q1~Q4 D7~D12
SWITCHING REGULATOR & PROTECTOR
PHS1 IC1
12V CTL
T1 POWER TRANS (SW REG)
D14
D16
D15
D17
D18
D21
CP2
Q5,IC1 12V SWITCHING
CP1
CN2
CN1
48V
MOTOR 12V
12V
6V
−30V
DC +4.6V
DC −4.6V
0 2 REGULATOR
CN3
CN6
D24
CP5
Q8,D25 UNSW 5V REG
Q7 POWER SWITCHER
CP4
CP3
SWD 5V REG
Q9~Q12
R37
SWD 5V
Q14~Q17
DC-AC CONV
CN7
CN4
UNSW 12V
UNSW 5.8V
POWER ON/OFF
SWD 12V
SWD 5V
0 4 M CONTROL
CN604
CN606
CN605
CN602
CN601
CN610
CN608
CP601
IC601
33
5 5 LOADING MDA
MOTOR 12V
5 1 DECK TERMINAL
CN1
CN2
CN3
5 7 CAP MDA
5 6 CASSETTE HOUSING
4 8 SERVO
CN406
CN404
CP401
5 8 DRUM MOTOR
RF CONVERTER
RF 12V
2 1 T/D/S
FDP
AC 4.6V
−30V
2 2 OP
9 5 S IF
45V
TNR 12V
0 8 TNR CTL
JP2
UNSW 5V
0 7 IF
7 0 JUNP DET
JP401
0 5 VIDEO UNIT
CN301
4 3 PRE/REC
CN305
0 3 MAIN (VIDEO)
CN501
CN701
5
4
3
2
1
A
B
C
D
E
F
G
H

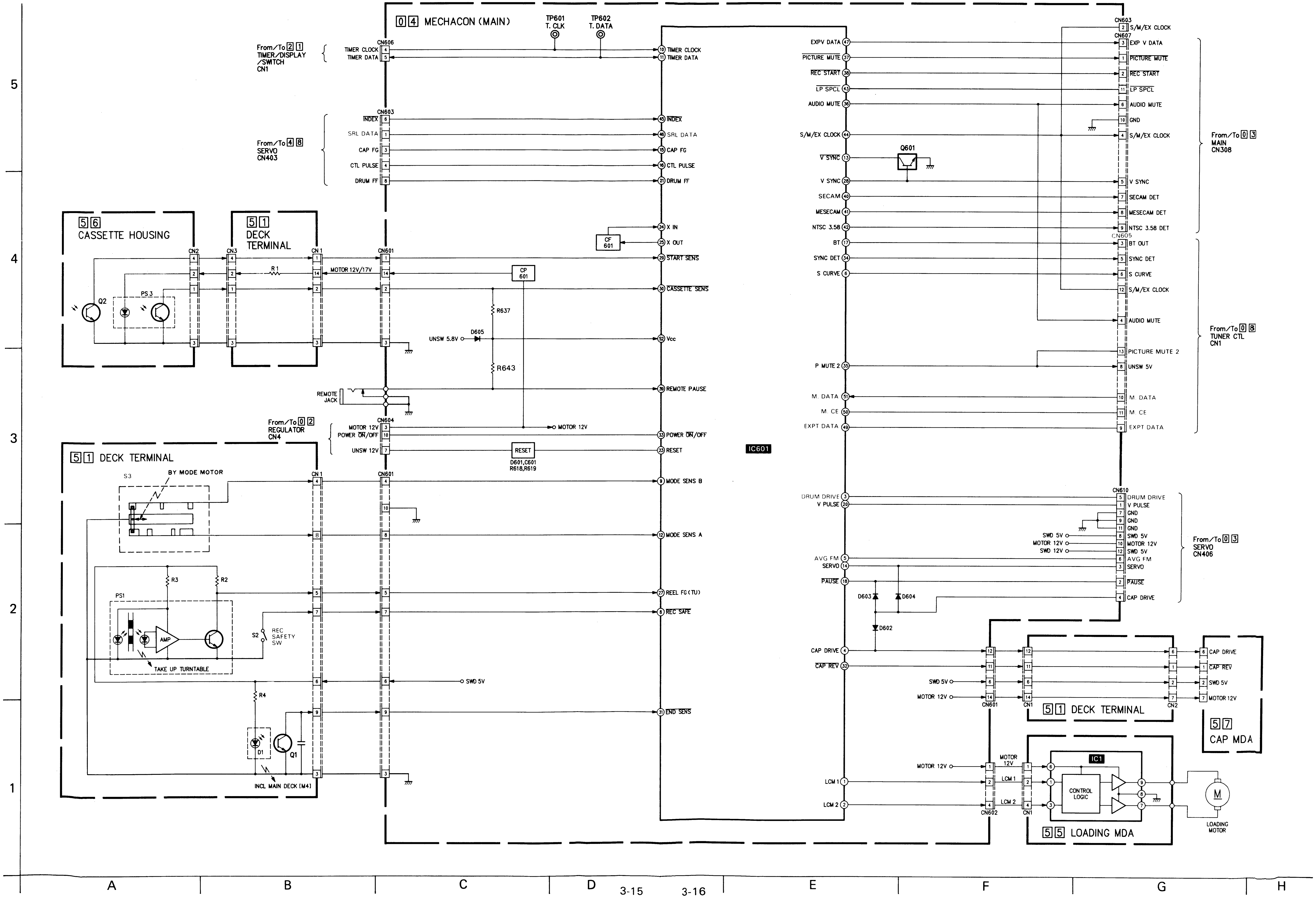
3.6 VIDEO UNIT BLOCK DIAGRAM


05 VIDEO UNIT
03 MAIN (VIDEO)
IC1 Y
IC201 NTSC COL
SYNC
Q9,R14 R15,C14
AGC DET FILTER
D5
C15
TNR VIDEO From TUNER
VIDEO From REAR
CN701
CN2
V PULSE
EE
EQ 2
D3
D4
Q8,C12,C13,L6 R13,R12,R11
PB : DC LEVEL OF SHARPNESS IS CONTROLLED. REC : OPEN
SHARP CTL
V PULSE ON
D7
SWD 5V
MUTE
WHITE LIMITER
BUFFER
ACC DET
ACC AMP
EE AMP
CLAMP
LPF 1
EQ 1
SUB CLAMP DET
SUB CLAMP
DEEMP
PB AMP
ANR
NOISE CANCEL
SUB NOISE CANCEL
SHARPNESS CTL AMP
YNR CTL
L : THROUTH, H : YNR
PULSE DELAY
DOC
LPF
FREQ DEMOD
LIMITER
MIX
HPF
DOUBLE LIMITER CIRCUIT
DETAIL ENHANCER
DYNAMIC HPF
LIMITER
NR
NR SW
YNR CIRCUIT
SYNC SEP
NLN EMP & DEEMP
NLN MIX
CLAMP
W/D CUP
MAIN EMP
CARR & DEV
FREQ MOD
FM CAR INT CTL
D2
CCIR
TP2
TP1
TNR/AUX
VIDEO
AGC VIDEO
YNR PULSE
PB FM
REC FM
PRCSSD VIDEO
PRCSSD: PROCESSED
From/To 03 MAIN (VIDEO)
Q16,R31,R33
NTSC
LEVEL ADJ
D11
R16
Q7 L5,R8,C9
DETAIL ENHANCER OFF SW
SWD 5V
L3
C3
L2
Q2 C2 R3
Q1 C1 R2
NTSC (Y) DEEMP
CCIR DEEMP
NC
SYNC
C5
COL ROT
Q4
ES
SP (NTSC)
IC 2
IC 3
IC 4
C22
C37
1H DL
3Fsc
Q12
Q14
Q11
Q13
BUFFER
LPF 2
LPF 3
R21
R27
NC BAL (NTSC)
NC BAL (PAL)
CN3
PB COL
CN1
DL DRIVE
COMB DRIVE
DL COL
PB COL
REC COL
PB COL
KILLER
LC201
4.21MHz TANK
C213
ACC DET FILTER
R203,C203
REC AFC/PB APC FILTER
SWD 5V
C209
BURST DE EMP
ACC AMP
ACC DET
REC/PB
CONV BAL
MAIN CONV
PB KILLER
LPF
REC KILLER BURST EMP
BPF 201
R209
L202,C211
H SYNC TRAP
1/2 CD
1/4 CD
SUB CONV
INV
4 PHASE SHIFT
BPF
100K
320fH VCO
REC AFC
CNT
ID DET
PB APC
VXO
COLOR DET
PB AFC
REC APC
PULSE GEN
H SYNC
BURST GATE
X 3
GND
X201
COL ROT CTL
C204,R202
COLOR DET FILTER
R201 D202,C201
SHORTLY EE To PB MUTE
D201
PB AFC FILTER
C207
SYNC
R207,C210
REC APC FILTER
Q201,D205
SP/EP MODE CTL
V PULSE ON
R204
D204
CF 201
3FSC (CN1-12)
NC
SP
EP
REC
PB
A
B
C
D
E
F
G
H
1
2
3
4
5

3.7 VIDEO BLOCK DIAGRAM

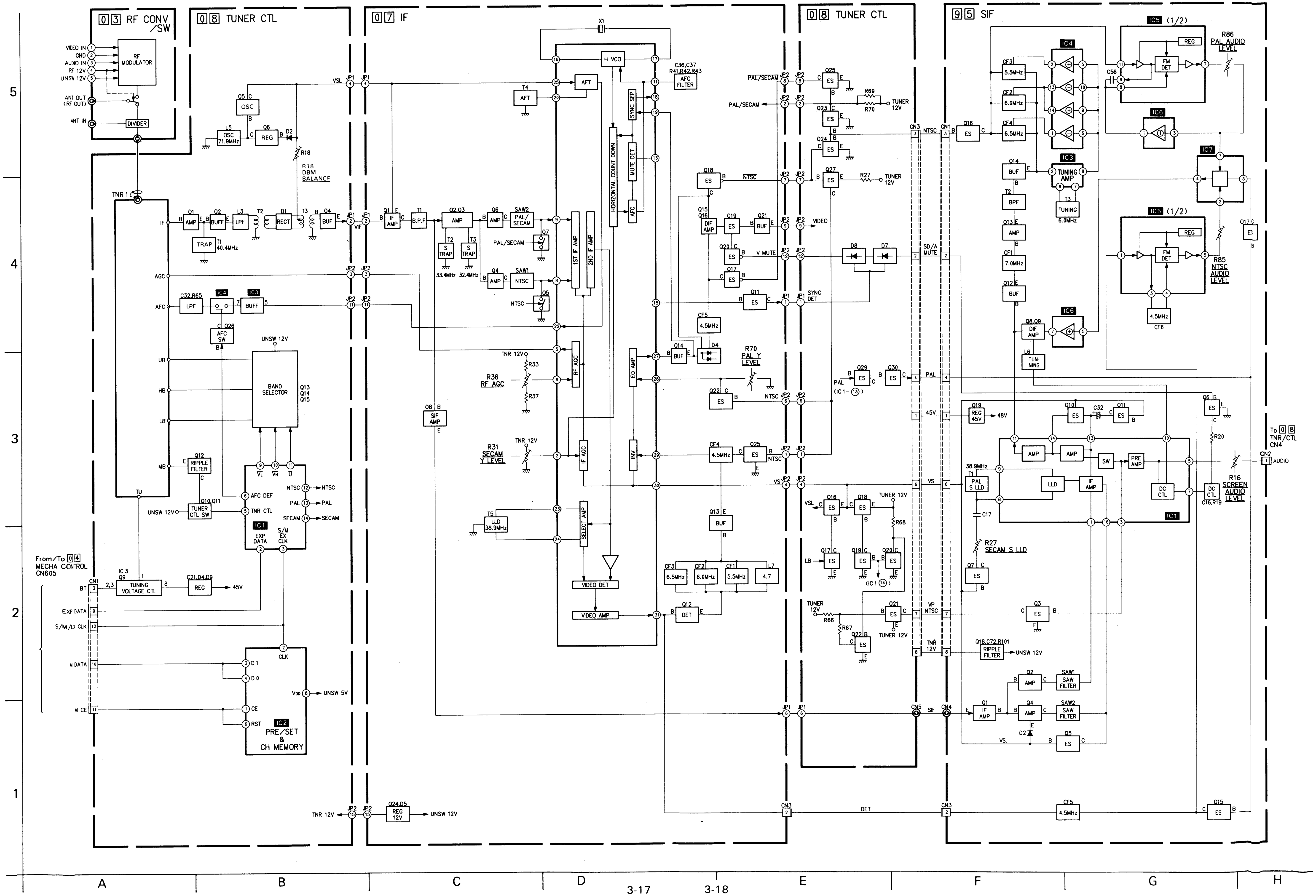

03 MAIN (VIDEO)
From/To 05 VIDEO UNIT
CN2
VIDEO IN
AGC VIDEO IN
PROCESS VIDEO
CN1
PB COL
DL COL
COMB DRIVE
DL DRIVE
REC FM
REC COL
PB COL
CN3
KILLER
Q101,L103,C102
PB EQ AMP
EQ 101
EQ
SECAM
L101
REC OUTPUT BELL
TP107
IC101 SECAM COL
LC102
PB OUTPUT BELL
SW 3
BPF 1.1MHz
CA 2
YA 2
VCA 1
1/4
LIM
1st X 2
MUTE 2
GAIN CTL
2nd X 2
BPF
NS
PB/REC
MUTE
CA 1
VCA 2
BPF 4.4MHz
SW 1
SW 2
1mS MMV
MUTE CTL
FP MMV
DRUM FF
SYNC
DL301
DL
IC301 REC COL
IC304 PB COL
R324 SECAM REC COL
Q307
BUFFER
R504 EP REC COL
L311,C340
HPF
Q314
Q501 Q309
SP/EP SWITCHER
R327 SP REC COL
TP305
ADDER COL & FM
Q313
R319 NTSC REC COL
Q306
R514 DELATED COL
Q103
Q104,Q105
Q102
D320
B/W:H
NTSC (3.58)
TP308
IC 502
Q504,Q505
AMP
DL501
DELAY
C509
1H JUMP PULSE
C108
C109,R110
LPF
C113
TP114
SWD 5V
C114
L104 SECAM DET
IC102 SECAM DET
SECAM DET
R111
COMP
FH/2 DET
LIMITER
CLAMP
FM DET
LIMITER SW
COMP 1
BGP
MM
ATT
C221 R113
FILTER
R334,R335
REF 2.2V
NTSC KILLER DETECT
IC303
3.58 DET
IC503
CCD CLK
3FSC
NTSC SLOW/STILL
IC302
3Fsc SW
CCIR : H
IC501
SKEW COMP PULSE
0.5H DL
Q206
DL201
NTSC
Q202,Q203
MESECAM 4.43 (NTSC) SWITCHER
D204
4.43 (NTSC)
Q319
BUF FER
R354
P MUTE
Q320
SWD 12V
TP310
R349 75
VIDEO OUT
Q318
D307
RF CONVERTOR
EQ302
Q317
C323
IC202 PAL COL
5.06MHz BPF 202
Q210
2H COMB DRIVE
ACC AMP
AUTO BAL
PB KILLER
LPF
REC KILLER AMP
C229 ACC DET FILTER
ACC DET
MAIN CONV
BPF 201
TP207
B/W: H MANU: H
D213 D214
D211
Q211 C235
COLOR KILLER DETECTOR
R245 R244
D209
POWER ON AT: H
1/2 CD
1/4 CD
SUB CONV
INV
4 PHASE SHIFT
100K
PB AFC
PB AFC FILTER
R242,R243 C238 D212
C232
SWD 5V
321fH VCO
REC AFC
CNT
ID DET
COLOR DET
PULSE GEN
SYNC
REC APC FILTER
C231
PB APC
VXO
4.43 NTSC DET
H. SYNC
BURST GATE
X 3
D210
D516
R236 D511
FH/2 TRAP
Q208,Q209 C226,C227 C228,L205
D208 D207 D206
EE
X201
COL ROT CTL
D205
Q207
CF201
R311 PAL REC COL
Q303
Q304
EP/LP
D503
Q506
R520
D323
Q305,C309,R314
CCIR FILTER
D301
NTSC SP
Q301
LPF301
LPF201
EQ201
Q201
Q212
TP307
TP306
Q302
MESECAM TRAP
Q205,L204,C222
D203
From 43 PRE/REC
CN304
PB FM COL
REC FM COL
PB FM
CN309
VIDEO FM
From 48 SERVO
D202
Q204
ES
R216
C209
D319
MANU
C210,R214
L207 MESECAM DET
TP214
C217
IC 201
IC201 MESECAM DET
MESECAM DET
R215
PAL
SECAM
PB EQ AMP
L306,L307 Q312,C330
R362
Q503
D514 D515
R506
Q502
D502
To 05 VIDEO UNIT
DL202
C215 R220
R226
TRAP
L202 C219
D201
R362 PB EQ (SP)
R506 PB EQ (EP/LP)
1 2 3 4 5
A B C D E F G H

3.8 SYSTEM CONTROL BLOCK DIAGRAM

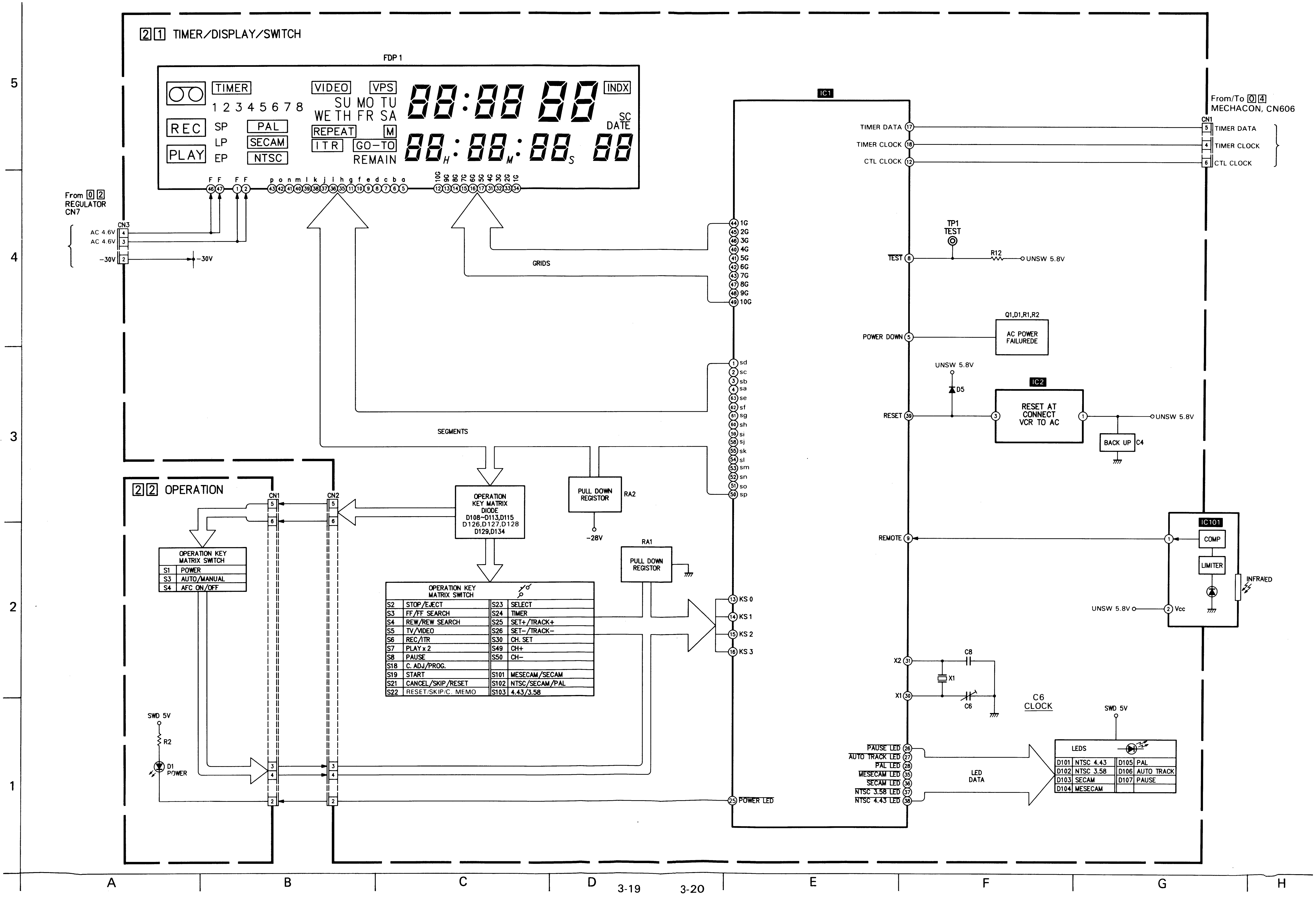


0 4 MECHACON (MAIN)
TP601 T. CLK
TP602 T. DATA
From/To 2 1 TIMER/DISPLAY /SWITCH CN1
CN606
TIMER CLOCK
TIMER DATA
From/To 4 8 SERVO CN403
CN603
INDEX
SRL DATA
CAP FG
CTL PULSE
DRUM FF
5 6 CASSETTE HOUSING
Q2
PS3
CN2
CN3
5 1 DECK TERMINAL
CN1
CN601
R1
MOTOR 12V/17V
CP 601
CF 601
R637
D605
UNSW 5.8V
R643
REMOTE JACK
From/To 0 2 REGULATOR CN4
CN604
MOTOR 12V
POWER ON/OFF
UNSW 12V
MOTOR 12V
RESET
D601,C601 R618,R619
5 1 DECK TERMINAL
S3
BY MODE MOTOR
PS1
R3
R2
AMP
S2
REC SAFETY SW
TAKE UP TURNTABLE
R4
D1
Q1
INCL MAIN DECK (M4)
SWD 5V
TIMER CLOCK
TIMER DATA
INDEX
SRL DATA
CAP FG
CTL PULSE
DRUM FF
X IN
X OUT
START SENS
CASSETTE SENS
Vcc
REMOTE PAUSE
POWER ON/OFF
RESET
MODE SENS B
MODE SENS A
REEL FG (TU)
REC SAFE
END SENS
IC601
EXPV DATA
PICTURE MUTE
REC START
LP SPCL
AUDIO MUTE
S/M/EX CLOCK
V SYNC
V SYNC
SECAM
MESECAM
NTSC 3.58
BT
SYNC DET
S CURVE
P MUTE 2
M. DATA
M. CE
EXPT DATA
Q601
CN603
S/M/EX CLOCK
CN607
EXP V DATA
PICTURE MUTE
REC START
LP SPCL
AUDIO MUTE
GND
S/M/EX CLOCK
V SYNC
SECAM DET
MESECAM DET
NTSC 3.58 DET
From/To 0 3 MAIN CN308
CN605
BT OUT
SYNC DET
S CURVE
S/M/EX CLOCK
AUDIO MUTE
PICTURE MUTE 2
UNSW 5V
M DATA
M CE
EXPT DATA
From/To 0 8 TUNER CTL CN1
DRUM DRIVE
V PULSE
AVG FM
SERVO
PAUSE
D603
D604
D602
CN610
DRUM DRIVE
V PULSE
GND
GND
GND
SWD 5V
MOTOR 12V
SWD 5V
AVG FM
SERVO
PAUSE
CAP DRIVE
SWD 5V
MOTOR 12V
SWD 12V
From/To 0 3 SERVO CN406
CAP DRIVE
CAP REV
SWD 5V
MOTOR 12V
CN601
CN1
CN2
5 1 DECK TERMINAL
CAP DRIVE
CAP REV
SWD 5V
MOTOR 12V
5 7 CAP MDA
MOTOR 12V
LCM 1
LCM 2
CN602
CN1
MOTOR 12V
LCM 1
LCM 2
IC1
CONTROL LOGIC
M
LOADING MOTOR
5 5 LOADING MDA
5
4
3
2
1
A
B
C
D
E
F
G
H

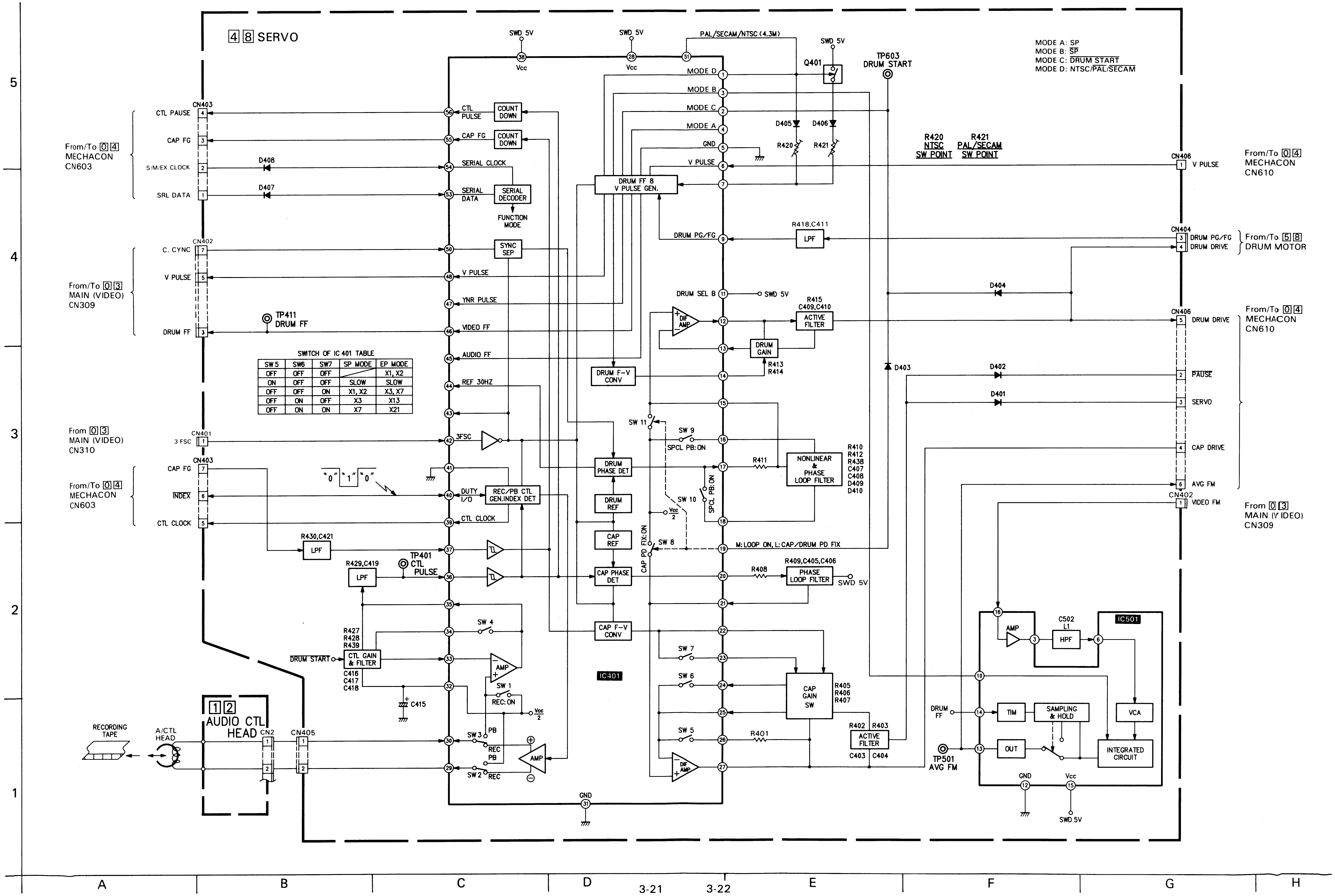
3.9 IF, TUNER CONTROL AND SIF BLOCK DIAGRAMS


03 RF CONV /SW
VIDEO IN
GND
AUDIO IN
RF 12V
UNSW 12V
RF MODULATOR
ANT OUT (RF OUT)
ANT IN
DIVIDER
TNR 1
IF
AGC
AFC
UB
HB
LB
MB
TU
08 TUNER CTL
Q5 OSC
L5 OSC 71.9MHz
Q6 REG
D2
R18 DBM BALANCE
VSL
Q1 AMP
Q2 BUFF
L3 LPF
T2
D1 RECT
T3
Q4 BUF
TRAP
T1 40.4MHz
C32,R65 LPF
IC4
IC3 BUFF
Q26 AFC SW
UNSW 12V
BAND SELECTOR
Q13 Q14 Q15
Q12 RIPPLE FILTER
Q10,Q11 TUNER CTL SW
AFC DEF
TNR CTL
NTSC
PAL
SECAM
IC1
EXP DATA
S/M EX CLK
From/To 04 MECHA CONTROL CN605
CN1
BT
EXP DATA
S/M /EX CLK
M DATA
M CE
IC 3 Q9 TUNING VOLTAGE CTL
C21,D4,D9 REG
45V
CLK
D 1
D 0
CE
RST
VDD
UNSW 5V
IC2 PRE/SET & CH MEMORY
TNR 12V
Q24,D5 REG 12V
07 IF
JP1
JP2
VIF
Q1 IF AMP
T1 B.P.F
Q2,Q3 AMP
T2 S TRAP
T3 S TRAP
33.4MHz
32.4MHz
Q6 AMP
SAW2 PAL/ SECAM
PAL/SECAM
Q7
Q4 AMP
SAW1 NTSC
Q5
Q8 SIF AMP
X1
H VCO
AFT
T4 AFT
C36,C37 R41,R42,R43 AFC FILTER
SYNC SEP
HORIZONTAL COUNT DOWN
MUTE DET
AFC
1ST IF AMP
2ND IF AMP
RF AGC
R33
R36 RF AGC
R37
R31 SECAM Y LEVEL
IF AGC
EQ AMP
INV
SELECT AMP
T5 LLD 38.9MHz
VIDEO DET
VIDEO AMP
Q12 DET
Q18 ES
Q15 Q16 DIF AMP
Q19 ES
Q21 BUF
Q20 ES
Q17 ES
Q11 ES
CF5 4.5MHz
Q14 BUF
D4
R70 PAL Y LEVEL
Q22 ES
CF4 4.5MHz
Q25 ES
Q13 BUF
CF3 6.5MHz
CF2 6.0MHz
CF1 5.5MHz
L7 4.7
NTSC
VIDEO
V MUTE
SYNC DET
VS
DET
08 TUNER CTL
PAL/SECAM
Q25 ES
Q23 ES
R69
R70
TUNER 12V
Q24 ES
Q27 ES
R27
D8
D7
Q29 ES
Q30 ES
PAL (IC1-13)
Q16 ES
Q18 ES
R68
Q17 ES
Q19 ES
Q22 ES
Q20 ES
(IC1 14)
LB
R66
R67
Q21 ES
CN3
CN5
95 SIF
CN1
NTSC
SD/A MUTE
PAL
45V
VS
VP NTSC
TNR 12V
SIF
CN4
Q16 ES
CF3 5.5MHz
CF2 6.0MHz
CF4 6.5MHz
IC4
IC3 TUNING AMP
T3 TUNING 6.0MHz
Q14 BUF
T2 BPF
Q13 AMP
CF1 7.0MHz
Q12 BUF
Q8,Q9 DIF AMP
IC6
L6 TUNNING
IC5 (1/2)
REG
FM DET
C56
R86 PAL AUDIO LEVEL
IC7
R85 NTSC AUDIO LEVEL
4.5MHz CF6
Q17 ES
Q6 ES
R20
Q19 REG 45V
48V
Q10 ES
C32
Q11 ES
AMP
SW
PRE AMP
38.9MHz T1 PAL S LLD
LLD
IF AMP
DC CTL
DC CTL C16,R19
R16 SCREEN AUDIO LEVEL
C17
R27 SECAM S LLD
Q7 ES
Q3 ES
Q18,C72,R101 RIPPLE FILTER
UNSW 12V
Q1 IF AMP
Q2 AMP
SAW1 SAW FILTER
Q4 AMP
SAW2 SAW FILTER
D2
Q5 ES
CF5 4.5MHz
Q15 ES
To 08 TNR/CTL CN4
CN2
AUDIO
A
B
C
D
E
F
G
H
1
2
3
4
5

3.10 TIMER/DISPLAY/SWITCH AND OPERATION BLOCK DIAGRAMS


21 TIMER/DISPLAY/SWITCH
FDP 1
TIMER
1 2 3 4 5 6 7 8
VIDEO
VPS
SU MO TU
WE TH FR SA
INDX
SC
DATE
REC
SP
PAL
LP
SECAM
PLAY
EP
NTSC
REPEAT
M
ITR
GO-TO
REMAIN
H M S
F F F F
p o n m l k j i h g f e d c b a
10G 9G 8G 7G 6G 5G 4G 3G 2G 1G
From 02 REGULATOR CN7
CN3
AC 4.6V
AC 4.6V
-30V
-30V
GRIDS
SEGMENTS
IC1
1G 2G 3G 4G 5G 6G 7G 8G 9G 10G
sd sc sb sa se sf sg sh si sj sk sl sm sn so sp
TIMER DATA 17
TIMER CLOCK 18
CTL CLOCK 12
TEST 8
POWER DOWN 5
RESET 39
REMOTE 9
KS 0
KS 1
KS 2
KS 3
X2 31
X1 30
POWER LED 25
PAUSE LED 26
AUTO TRACK LED 27
PAL LED 28
MESECAM LED 35
SECAM LED 36
NTSC 3.58 LED 37
NTSC 4.43 LED 38
From/To 04 MECHACON, CN606
CN1
TIMER DATA
TIMER CLOCK
CTL CLOCK
TP1 TEST
R12
UNSW 5.8V
Q1,D1,R1,R2
AC POWER FAILUREDE
UNSW 5.8V
D5
IC2
RESET AT CONNECT VCR TO AC
UNSW 5.8V
BACK UP C4
IC101
COMP
LIMITER
INFRARED
UNSW 5.8V
Vcc
C8
X1
C6
C6 CLOCK
SWD 5V
LED DATA
LEDS
D101 NTSC 4.43
D102 NTSC 3.58
D103 SECAM
D104 MESECAM
D105 PAL
D106 AUTO TRACK
D107 PAUSE
PULL DOWN REGISTOR RA2
-28V
RA1
PULL DOWN REGISTOR
OPERATION KEY MATRIX DIODE D108~D113,D115 D126,D127,D128 D129,D134
OPERATION KEY MATRIX SWITCH
S2 STOP/EJECT
S3 FF/FF SEARCH
S4 REW/REW SEARCH
S5 TV/VIDEO
S6 REC/ITR
S7 PLAY x 2
S8 PAUSE
S18 C. ADJ/PROG.
S19 START
S21 CANCEL/SKIP/RESET
S22 RESET/SKIP/C. MEMO
S23 SELECT
S24 TIMER
S25 SET+/TRACK+
S26 SET-/TRACK-
S30 CH. SET
S49 CH+
S50 CH-
S101 MESECAM/SECAM
S102 NTSC/SECAM/PAL
S103 4.43/3.58
22 OPERATION
CN1
CN2
OPERATION KEY MATRIX SWITCH
S1 POWER
S3 AUTO/MANUAL
S4 AFC ON/OFF
SWD 5V
R2
D1 POWER
5 4 3 2 1
A B C D E F G H

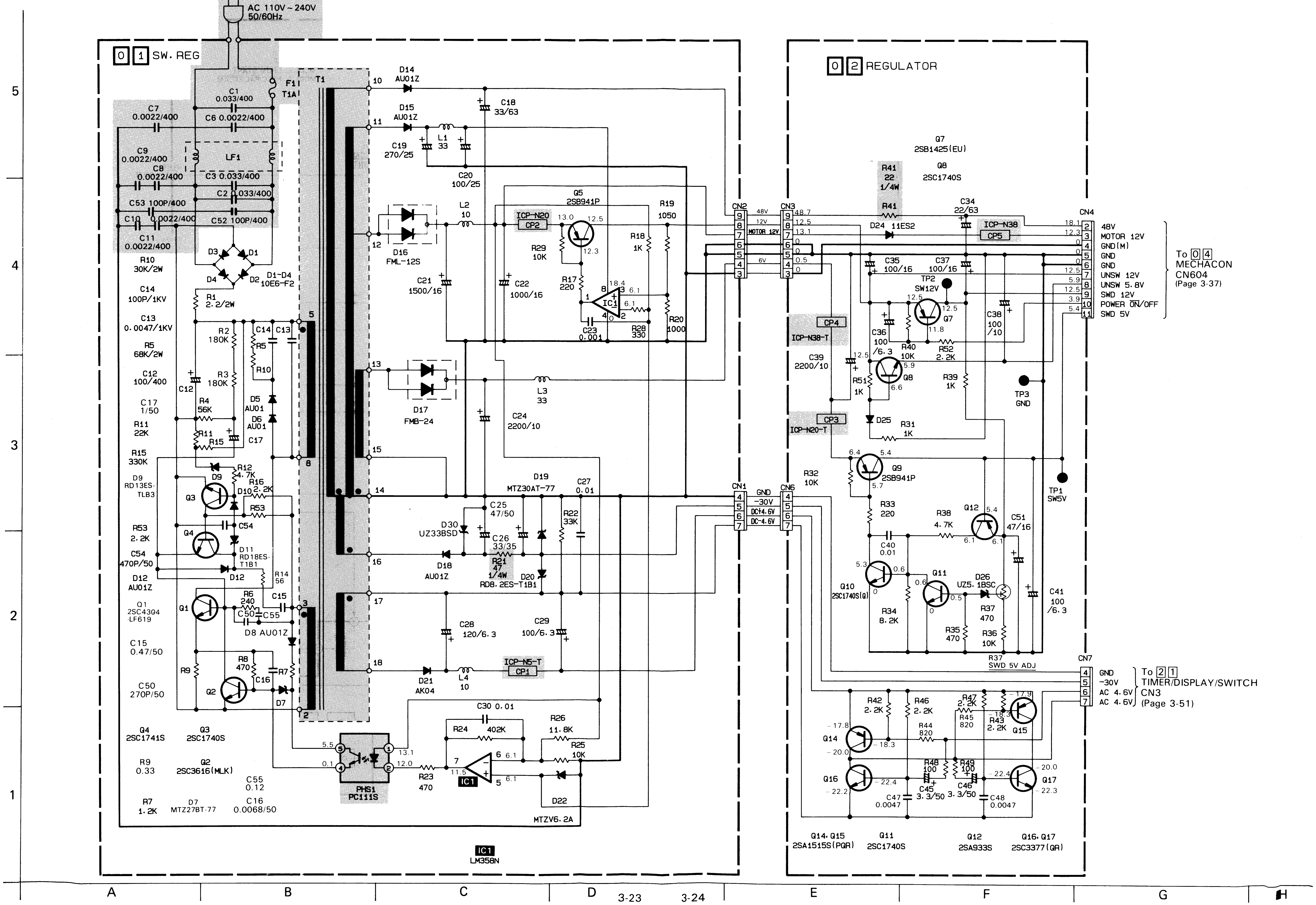
3.11 SERVO BLOCK DIAGRAM


4 8 SERVO
SWD 5V
Vcc
PAL/SECAM/NTSC (4.3M)
MODE D
MODE B
MODE C
MODE A
GND
V PULSE
Q401
TP603
DRUM START
MODE A: SP
MODE B: SP
MODE C: DRUM START
MODE D: NTSC/PAL/SECAM
D405
D406
R420
R421
R420 NTSC SW POINT
R421 PAL/SECAM SW POINT
From/To 0 4
MECHACON
CN603
CN403
CTL PAUSE
CAP FG
S/M/EX CLOCK
SRL DATA
D408
D407
CTL PULSE
COUNT DOWN
SERIAL CLOCK
SERIAL DATA
SERIAL DECODER
FUNCTION MODE
DRUM FF 8 V PULSE GEN.
CN406
V PULSE
From/To 0 4
MECHACON
CN610
DRUM PG/FG
R418,C411
LPF
CN404
DRUM DRIVE
From/To 5 8
DRUM MOTOR
From/To 0 3
MAIN (VIDEO)
CN309
CN402
C. CYNC
V PULSE
DRUM FF
TP411
DRUM FF
SYNC SEP
YNR PULSE
VIDEO FF
AUDIO FF
REF 30HZ
DRUM SEL B
SWD 5V
DIF AMP
R415
C409,C410
ACTIVE FILTER
DRUM GAIN
R413
R414
DRUM F-V CONV
D404
D403
D402
D401
PAUSE
SERVO
CAP DRIVE
AVG FM
VIDEO FM
From 0 3
MAIN (VIDEO)
CN310
CN401
3 FSC
3FSC
"0" "1" "0"
DUTY I/O
REC/PB CTL GEN.INDEX DET
INDEX
CTL CLOCK
From/To 0 4
MECHACON
CN603
R430,C421
LPF
R429,C419
TP401
CTL PULSE
SW 11
SW 9
SPCL PB: ON
SW 10
SPCL PB: ON
Vcc/2
SW 8
CAP PD FIX: ON
DRUM PHASE DET
DRUM REF
CAP REF
CAP PHASE DET
CAP F-V CONV
R411
NONLINEAR & PHASE LOOP FILTER
R410
R412
R438
C407
C408
D409
D410
M: LOOP ON, L: CAP/DRUM PD FIX
R408
R409,C405,C406
PHASE LOOP FILTER
SWD 5V
SW 4
R427
R428
R439
DRUM START
CTL GAIN & FILTER
C416
C417
C418
AMP
SW 1
REC: ON
Vcc/2
C415
IC401
SW 7
SW 6
SW 5
CAP GAIN SW
R405
R406
R407
R401
R402
R403
ACTIVE FILTER
C403
C404
DIF AMP
RECORDING TAPE
A/CTL HEAD
1 2
AUDIO CTL HEAD
CN2
CN405
SW 3
PB
REC
SW 2
REC
PB
AMP
GND
IC501
AMP
C502
L1
HPF
DRUM FF
TIM
SAMPLING & HOLD
VCA
TP501
AVG FM
OUT
INTEGRATED CIRCUIT
GND
Vcc
SWD 5V
1
2
3
4
5
A
B
C
D
E
F
G
H

SWITCH OF IC 401 TABLE

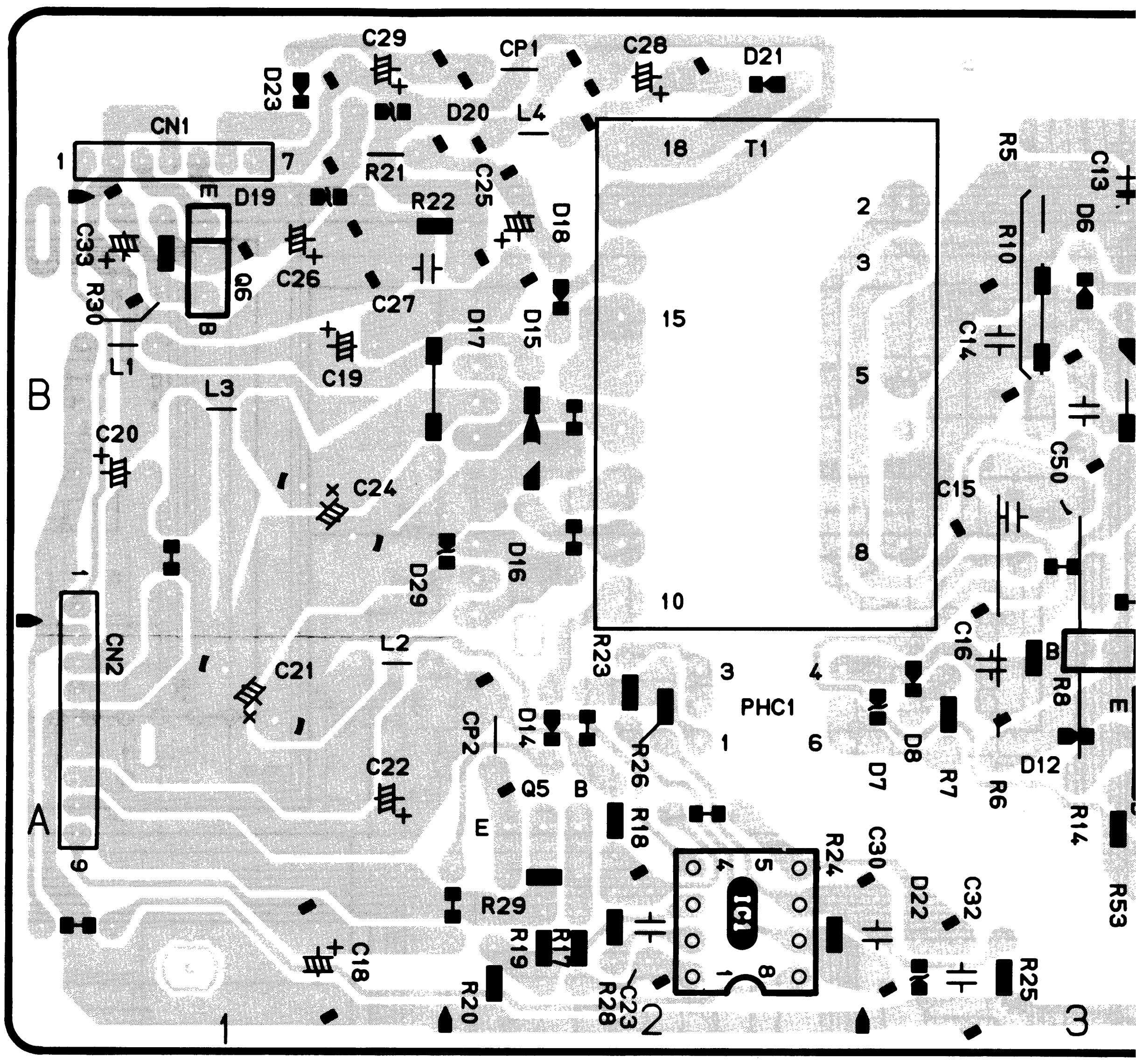
SW 5	SW6	SW7	SP MODE	EP MODE
OFF	OFF	OFF		X1, X2
ON	OFF	OFF	SLOW	SLOW
OFF	OFF	ON	X1, X2	X3, X7
OFF	ON	OFF	X3	X13
OFF	ON	ON	X7	X21

3.12 SWITCHING REGULATOR AND REGULATOR SCHEMATIC DIAGRAMS


AC 110V~240V
50/60Hz
01 SW. REG
02 REGULATOR
F1 T1A
T1
C1 0.033/400
C7 0.0022/400
C6 0.0022/400
C9 0.0022/400
C8 0.0022/400
LF1
C3 0.033/400
C2 0.033/400
C53 100P/400
C10 0.0022/400
C52 100P/400
C11 0.0022/400
D1~D4 10E6-F2
R10 30K/2W
C14 100P/1KV
C13 0.0047/1KV
R5 68K/2W
C12 100/400
C17 1/50
R11 22K
R15 330K
D9 RD13ES-TLB3
R53 2.2K
C54 470P/50
D12 AU01Z
Q1 2SC4304 -LF619
C15 0.47/50
C50 270P/50
Q4 2SC1741S
Q3 2SC1740S
R9 0.33
Q2 2SC3616(MLK)
R7 1.2K
D7 MTZ27BT-77
C55 0.12
C16 0.0068/50
R1 2.2/2W
R2 180K
R3 180K
R4 56K
D5 AU01
D6 AU01
R12 4.7K
R16 2.2K
D11 RD18ES-T1B1
R14 56
R6 240
D8 AU01Z
R8 470
D14 AU01Z
D15 AU01Z
C18 33/63
C19 270/25
L1 33
C20 100/25
D16 FML-12S
L2 10
C21 1500/16
C22 1000/16
Q5 2SB941P
ICP-N20 CP2
R29 10K
R17 220
IC1
C23 0.001
R28 330
R18 1K
R19 1050
R20 1000
D17 FMB-24
L3 33
C24 2200/10
D19 MTZ30AT-77
C27 0.01
D30 UZ33BSD
C25 47/50
C26 33/35
R21 47 1/4W
R22 33K
D18 AU01Z
D20 RD8.2ES-T1B1
C28 120/6.3
C29 100/6.3
ICP-N5-T CP1
D21 AK04
L4 10
C30 0.01
R24 402K
R26 11.8K
R25 10K
PHS1 PC111S
R23 470
D22
MTZV6.2A
IC1 LM358N
CN2
CN1
CN3
CN6
48V
12V
MOTOR 12V
6V
GND
-30V
DC+4.6V
DC-4.6V
Q7 2SB1425(EU)
Q8 2SC1740S
R41 22 1/4W
D24 11ES2
C34 22/63
ICP-N38 CP5
C35 100/16
C37 100/16
TP2 SW12V
CP4 ICP-N38-T
C36 100 /6.3
C39 2200/10
R40 10K
R52 2.2K
C38 100 /10
R51 1K
R39 1K
TP3 GND
CP3 ICP-N20-T
D25
R31 1K
Q9 2SB941P
R32 10K
TP1 SW5V
R33 220
R38 4.7K
Q12
C51 47/16
C40 0.01
Q10 2SC1740S(Q)
Q11
D26 UZ5.1BSC
C41 100 /6.3
R34 8.2K
R35 470
R37 470
R36 10K
R37 SWD 5V ADJ
CN4
48V
MOTOR 12V
GND(M)
GND
GND
UNSW 12V
UNSW 5.8V
SWD 12V
POWER ON/OFF
SWD 5V
To 04 MECHACON CN604 (Page 3-37)
CN7
GND
-30V
AC 4.6V
AC 4.6V
To 21 TIMER/DISPLAY/SWITCH CN3 (Page 3-51)
R42 2.2K
R46 2.2K
R47 2.2K
R43 2.2K
R45 820
R44 820
Q14
Q15
Q16
Q17
R48 100
R49 100
C45 3.3/50
C46 3.3/50
C47 0.0047
C48 0.0047
Q14, Q15 2SA1515S(PQR)
Q11 2SC1740S
Q12 2SA933S
Q16, Q17 2SC3377(QR)
1
2
3
4
5
A
B
C
D
E
F
G
H

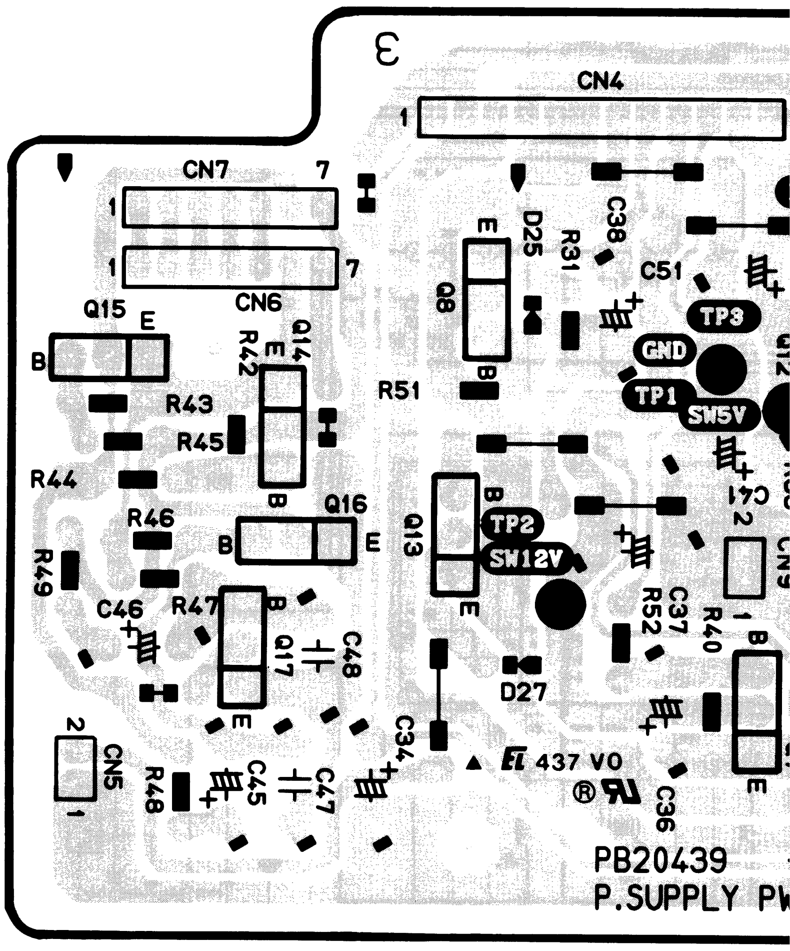
3.13 SWITCHING REGULATOR AND REGULATOR CIRCUIT BOARDS

—SWITCHING REGULATOR—

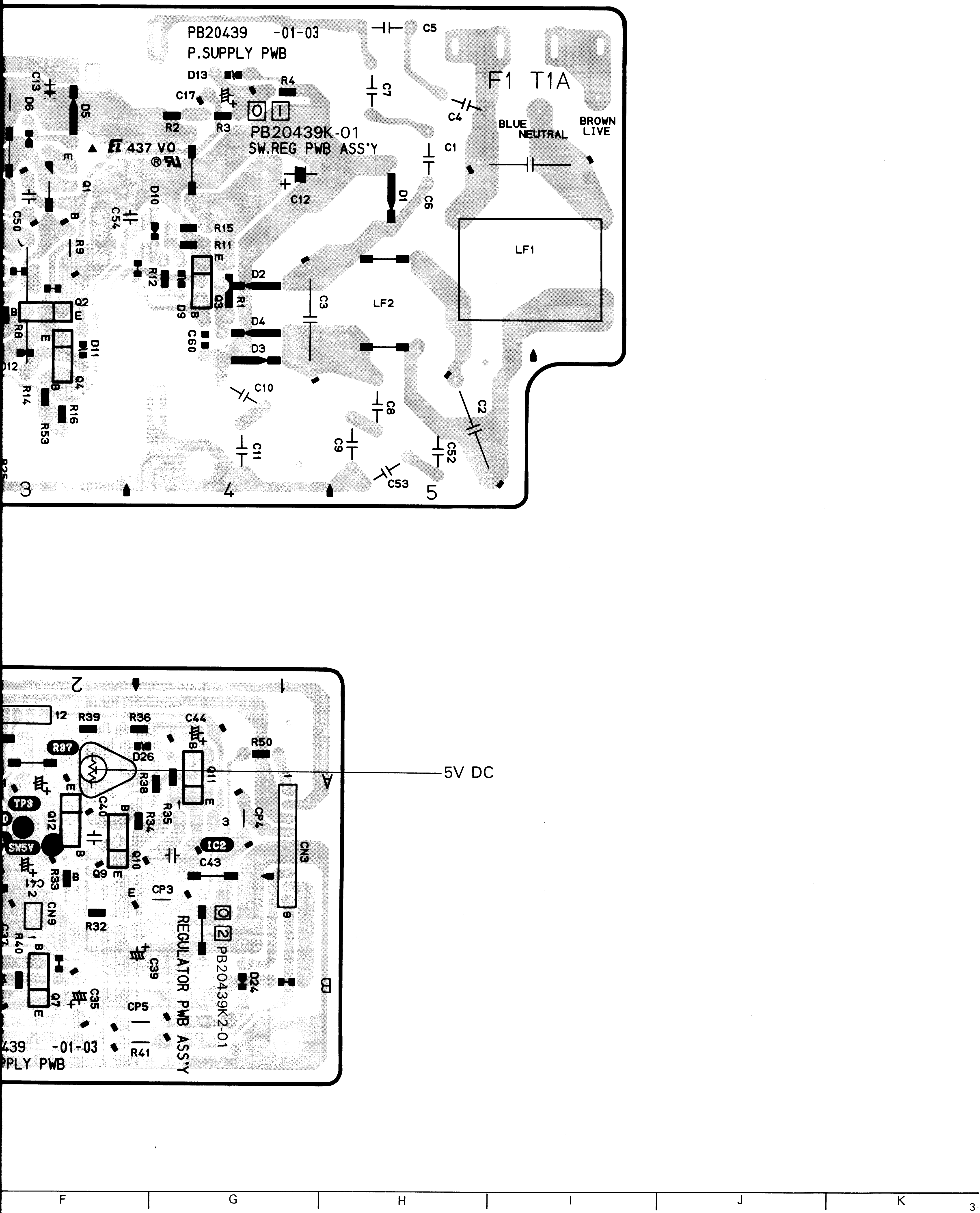


C29
CP1
C28
D21
D23
D20
L4
CN1
1
7
R21
R22
C25
T1
18
R5
C13
D19
D18
2
R10
D6
C33
Q6
E
B
C26
C27
3
R30
D17
D15
15
C14
L1
C19
5
B
L3
C20
C50
C24
C15
D16
8
D29
1
10
CN2
C16
R8
L2
R23
3
4
C21
PHC1
D14
CP2
R26
1
6
D8
R7
D12
D7
R6
C22
Q5
B
E
R18
R14
A
R24
C30
9
D22
C32
R53
R29
IC1
R19
R17
C18
R20
R28
C23
R25
1
2
3

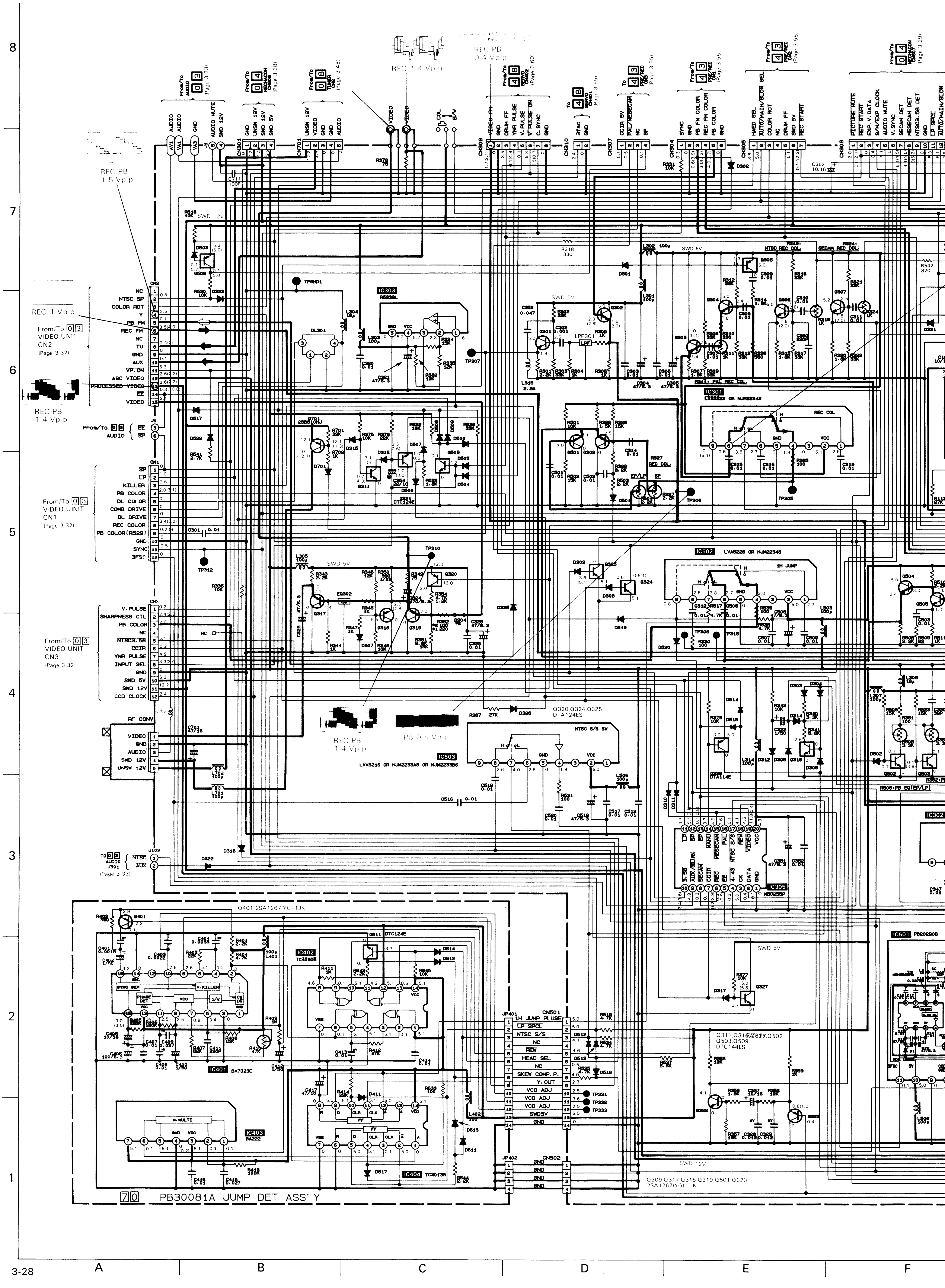
—REGULATOR—

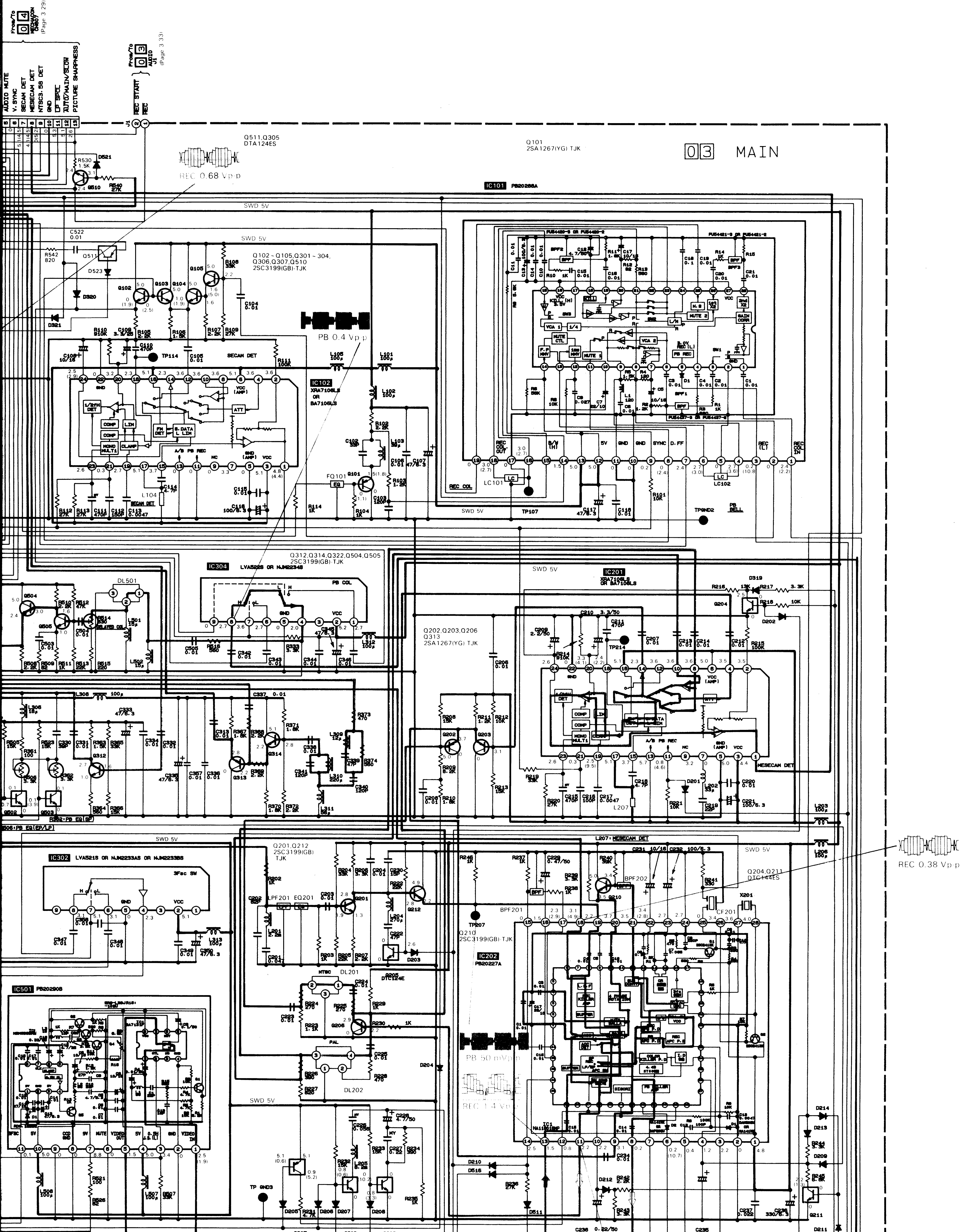


3
CN4
1
CN7
7
1
1
7
D25
C38
R31
C51
Q8
E
B
CN6
Q15
E
B
R42
Q14
E
TP3
GND
R51
TP1
SW5V
R43
R45
R44
B
R46
Q16
B
E
Q13
TP2
SW12V
R49
C46
R47
B
Q17
C48
E
R52
C37
R40
D27
2
CN5
1
R48
C45
C47
C34
437 VO
C36
PB20439
P.SUPPLY PW
8
7
6
5
4
3
2
1
A
B
C
D
E


PB20439 -01-03
P.SUPPLY PWB
PB20439K-01
SW.REG PWB ASS'Y
F1 T1A
BLUE
NEUTRAL
BROWN
LIVE
LF1
LF2
437 V0
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C17
C50
C52
C53
C54
C60
D1
D2
D3
D4
D5
D6
D9
D10
D11
D13
Q1
Q2
Q3
Q4
R1
R2
R3
R4
R8
R9
R11
R12
R14
R15
R16
R53
3
4
5
2
1
A
B
R39
R36
C44
R50
R37
D26
R38
Q11
R35
R34
C40
Q12
TP3
SW5V
Q9
Q10
IC2
C43
CP4
CN3
R33
CP3
CN9
R32
R40
C39
D24
C35
Q7
CP5
R41
REGULATOR PWB ASS'Y
PB20439K2-01
439 -01-03
PPLY PWB
5V DC
F
G
H
I
J
K

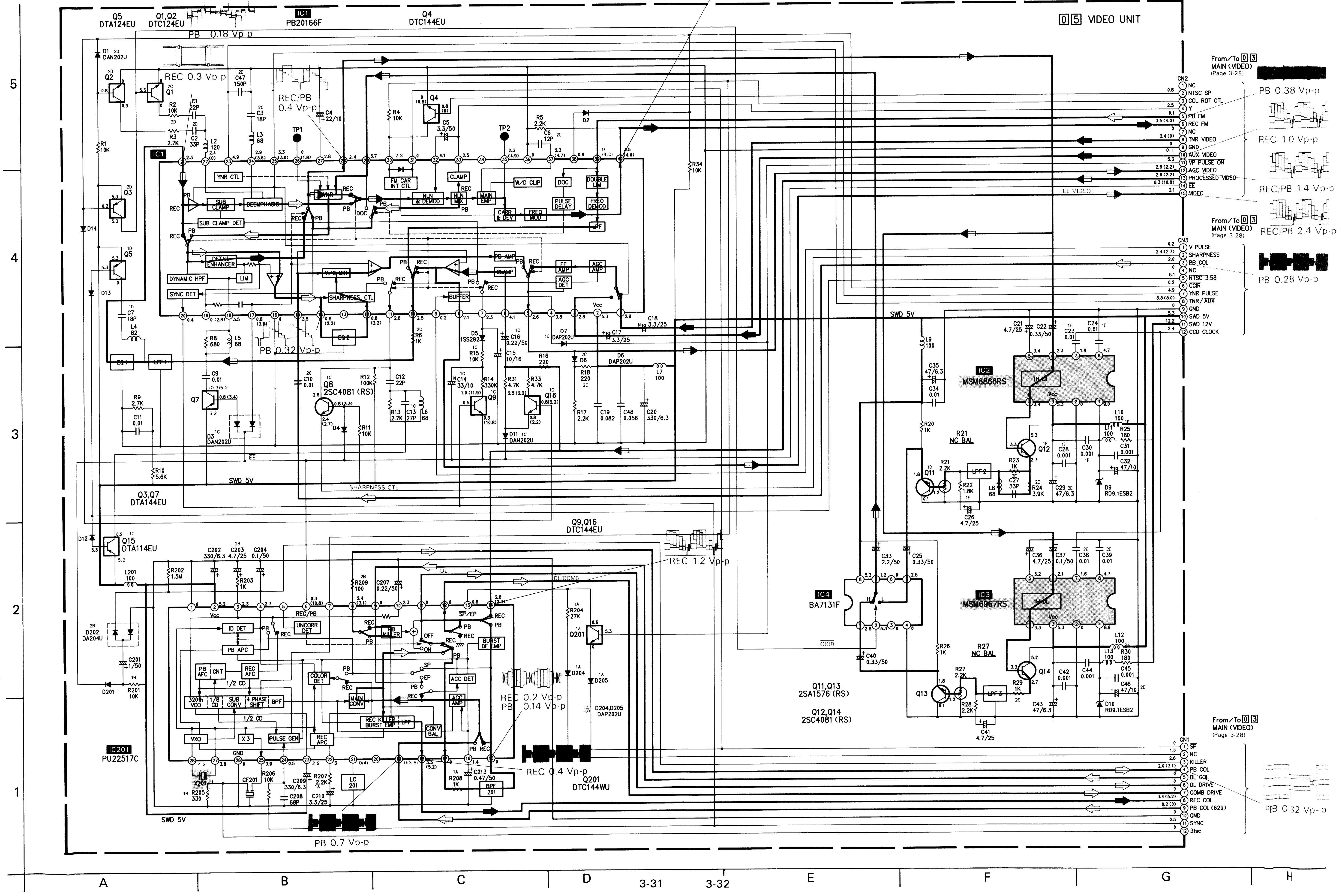
3.14 VIDEO AND JUMP DET SCHEMATIC DIAGRAM


REC PB
1.5 Vp-p
REC 1 Vp-p
From/To 03
VIDEO UNIT
CN2
(Page 3.32)
REC PB
1.4 Vp-p
From/To 03
AUDIO
From/To 03
VIDEO UNIT
CN1
(Page 3.32)
From/To 03
VIDEO UNIT
CN3
(Page 3.32)
To 03
AUDIO
J301
(Page 3.33)
REC 1.4 Vp-p
REC PB
0.4 Vp-p
From/To AUDIO 03 (Page 3.33)
From/To MECHACON CN808 04 (Page 3.38)
From/To TUNER CN2 08 (Page 3.48)
From/To SERVO CN402 48 (Page 3.60)
To SERVO CN401 48 (Page 3.55)
To PRE/REC CN5 43 (Page 3.55)
From/To PRE/REC CN4 43 (Page 3.55)
From/To PRE/REC CN2 43 (Page 3.55)
From/To MECHACON CN807 04 (Page 3.29)
NC
NTSC SP
COLOR ROT
Y
PB FM
REC FM
NC
TU
GND
AUX
VP. ON
AGC VIDEO
PROCESSED VIDEO
EE
VIDEO
EE
SP
LP
KILLER
PB COLOR
DL COLOR
COMB DRIVE
DL DRIVE
REC COLOR
PB COLOR(R529)
GND
SYNC
3FSC
V. PULSE
SHARPNESS CTL
PB COLOR
NC
NTSC3.58
CCIR
YNR PULSE
INPUT SEL
GND
SWD 5V
SWD 12V
CCD CLOCK
RF CONV
VIDEO
GND
AUDIO
SWD 12V
UNSW 12V
NTSC
AUX
IC303
IC301
LVA5228 OR NJM2234S
REC COL
IC502
LVA5228 OR NJM2234S
1H JUMP
IC503
LVA521S OR NJM2233AS OR NJM2233BS
NTSC S/S SW
IC305
IC302
IC501
Q320,Q324,Q325
DTA124ES
Q401 2SA1267(YG) TJK
IC401 BA7023C
IC402 TC4030B
IC403 BA222
IC404 TC4013B
H. MULTI
SYNC SEP
V. KILLER
PHASE DET
VCO
1/2
FF
JP401
CN501
1H JUMP PLUSE
LP SPCL
NTSC S/S
NC
REW
HEAD SEL
NC
SKEW COMP. P.
Y. OUT
VCO ADJ
VCO ADJ
SWD5V
GND
JP402
CN502
GND
GND
GND
GND
TP331
TP332
TP333
Q311,Q316,Q327,Q502
Q503,Q509
DTC144ES
Q309,Q317,Q318,Q319,Q501,Q323
2SA1267(YG) TJK
SWD 5V
SWD 12V
70 PB30081A JUMP DET ASS'Y
A
B
C
D
E
F
1
2
3
4
5
6
7
8


03 MAIN
AUDIO MUTE
V.SYNC
SECAM DET
MESECAM DET
NTSC3.58 DET
GND
LP SPCL
AUTO/MAIN/SLOW
PICTURE SHARPNESS
From/To 04 MECHACON (Page 3-29)
REC START
REC
From/To 03 AUDIO J1 (Page 3-33)
Q511,Q305 DTA124ES
Q101 2SA1267(YG) TJK
REC 0.68 Vp-p
IC101 PB20288A
SWD 5V
Q102~Q105,Q301~304, Q306,Q307,Q510 2SC3199(GB)-TJK
PB 0.4 Vp-p
IC102 XRA7106LS OR BA7106LS
SECAM DET
FQ101 EQ
REC COL
LC101
TP107
LC102
TPGND2
PB BELL
REC COL OUT
B/W (H)
5V
GND
SYNC
D.FF
REC (L)
REC COL IN
IC304 LVA522S OR NJM2234S
PB COL
Q312,Q314,Q322,Q504,Q505 2SC3199(GB)-TJK
DL501
DELAYED COL
IC201 XRA7106LS OR BA7106LS
Q202,Q203,Q206 Q313 2SA1267(YG) TJK
MESECAM DET
REC 0.38 Vp-p
IC302 LVA521S OR NJM2233AS OR NJM2233BS
3Fsc SW
Q201,Q212 2SC3199(GB) TJK
LPF201
EQ201
NTSC
DL201
PAL
DL202
L207: MESECAM DET
Q204,Q211 DTC144ES
BPF202
BPF201
X201
CF201
Q210 2SC3199(GB) TJK
TP207
IC202 PB20227A
PB 50 mVp-p
REC 1.4 Vp-p
IC501 PB20290B
SFSC
CCD GND
9V
MUTE
VIDEO OUT
5V
GND
VIDEO IN
TP GND3
Q207 DTA144ES
Q208 DTC124ES
Q209 DTC124ES
D205
D206
D207
D208
D210
D516
D511
D212
D213
D214
D209
D211
C236 0.22/50
C235 0.47/50
PB 1 Vp-p
F
G
H
I
J
K

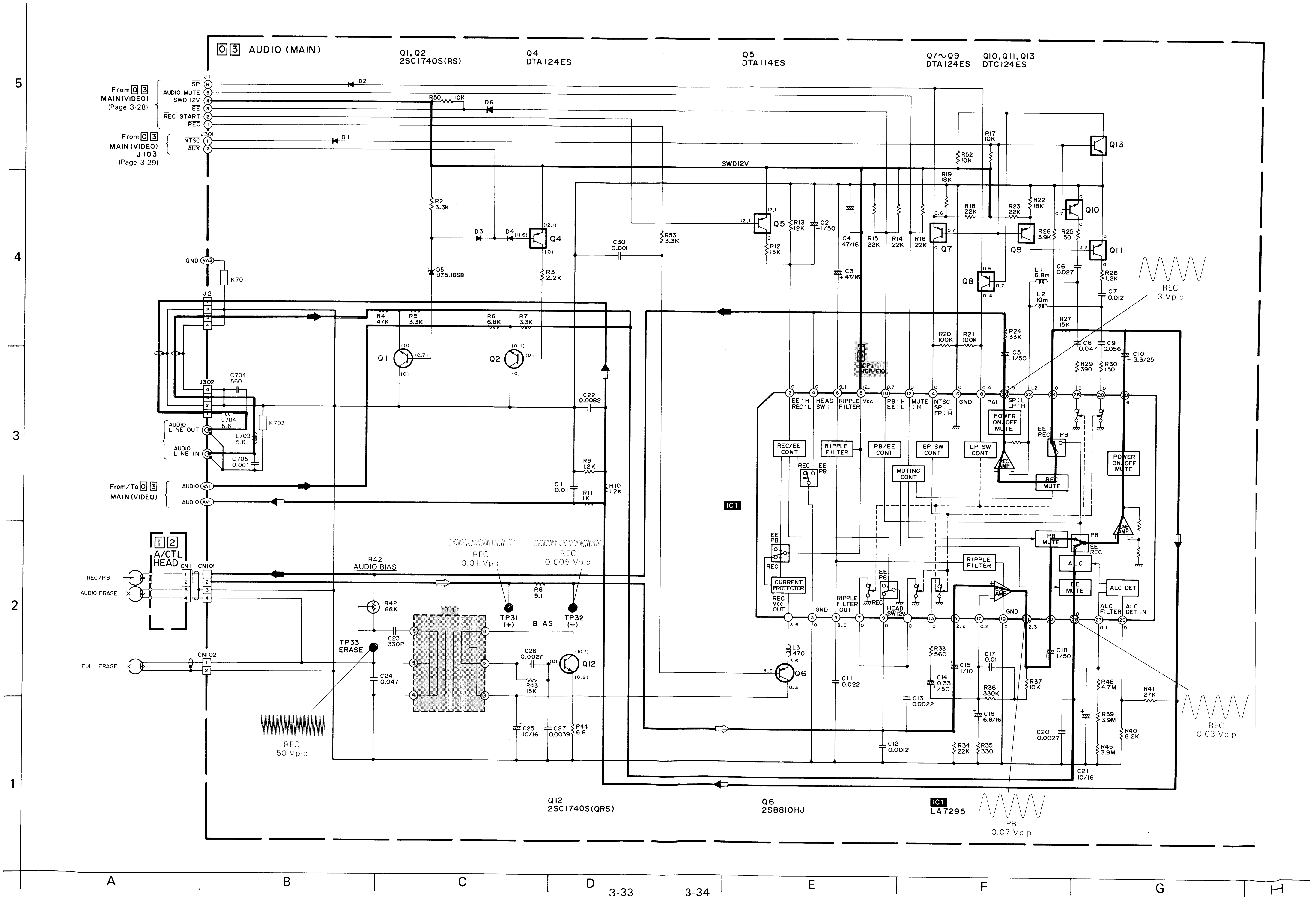
3.15 VIDEO UNIT SCHEMATIC DIAGRAM

• Address of chip parts
1D
└—Address



05 VIDEO UNIT
Q5 DTA124EU
Q1,Q2 DTC124EU
IC1 PB20166F
Q4 DTC144EU
PB 0.18 Vp-p
REC 0.3 Vp-p
REC/PB 0.4 Vp-p
REC 0.9 Vp-p
TP1
TP2
YNR CTL
SUB CLAMP
DEEMPHASIS
SUB CLAMP DET
FM CAR INT CTL
NLN & DEMOD
NLN MIX
MAIN EMP
CLAMP
W/D CLIP
DOC
DOUBLE LIM
PULSE DELAY
FREQ DEMOD
CARR & DEV
FREQ MOD
LPF
DETAIL ENHANCER
DYNAMIC HPF
LIM
SYNC DET
Y/C MIX
SHARPNESS CTL
EQ 2
PB AMP
CLAMP
BUFFER
EE AMP
AGC AMP
AGC DET
PB 0.32 Vp-p
EQ 1
LPF 1
Q3,Q7 DTA144EU
Q8 2SC4081 (RS)
Q9,Q16 DTC144EU
SWD 5V
SHARPNESS CTL
EE
Q15 DTA114EU
IC201 PU22517C
ID DET
PB APC
UNCORR DET
PB KILLER
BURST DE EMP
PB AFC
CNT
REC AFC
1/2 CD
COLOR DET
320fh VCO
1/8 CD
SUB CONV
4 PHASE SHIFT
BPF
MAIN CONV
ACC DET
ACC AMP
REC KILLER BURST EMP
LPF
CONV BAL
VXO
X3
PULSE GEN
REC APC
LC 201
BPF 201
SP/EP
DL
DL COMB
REC 1.2 Vp-p
REC 0.2 Vp-p
PB 0.14 Vp-p
REC 0.4 Vp-p
PB 0.7 Vp-p
Q201 DTC144WU
D204,D205 DAP202U
IC2 MSM6866RS
IC3 MSM6967RS
IC4 BA7131F
1H DL
Vcc
R21 NC BAL
R27 NC BAL
LPF 2
LPF 3
Q11,Q13 2SA1576 (RS)
Q12,Q14 2SC4081 (RS)
CCIR
EE VIDEO
SWD 5V
From/To 03 MAIN (VIDEO) (Page 3-28)
CN2
1 NC
2 NTSC SP
3 COL ROT CTL
4 Y
5 PB FM
6 REC FM
7 NC
8 TNR VIDEO
9 GND
10 AUX VIDEO
11 VP PULSE ON
12 AGC VIDEO
13 PROCESSED VIDEO
14 EE
15 VIDEO
PB 0.38 Vp-p
REC 1.0 Vp-p
REC/PB 1.4 Vp-p
REC/PB 2.4 Vp-p
CN3
1 V PULSE
2 SHARPNESS
3 PB COL
4 NC
5 NTSC 3.58
6 CCIR
7 YNR PULSE
8 TNR/AUX
9 GND
10 SWD 5V
11 SWD 12V
12 CCD CLOCK
PB 0.28 Vp-p
CN1
1 SP
2 NC
3 KILLER
4 PB COL
5 DL COL
6 DL DRIVE
7 COMB DRIVE
8 REC COL
9 PB COL (629)
10 GND
11 SYNC
12 3fsc
PB 0.32 Vp-p
1
2
3
4
5
A
B
C
D
E
F
G
H

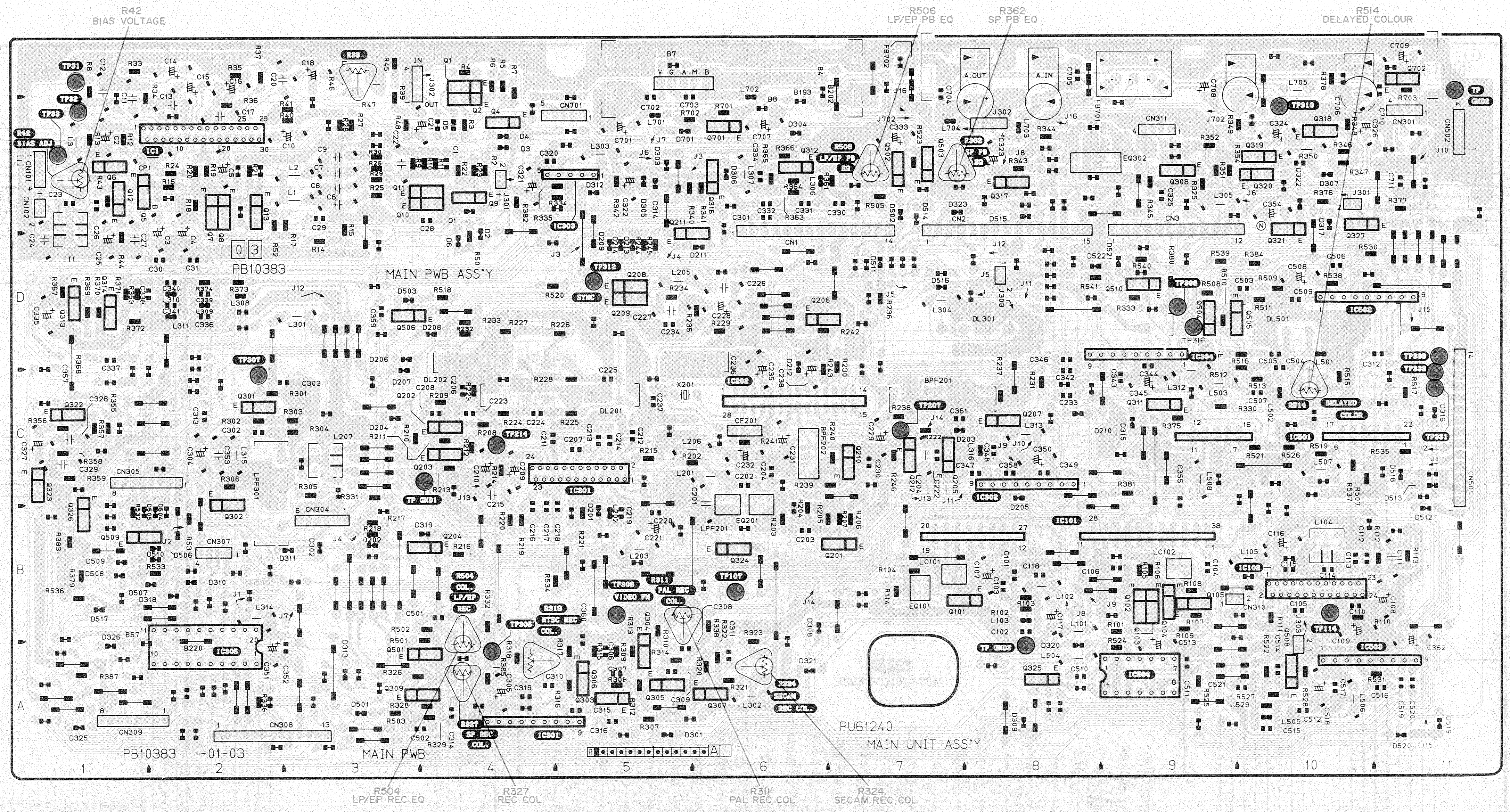
3.16 AUDIO SCHEMATIC DIAGRAM



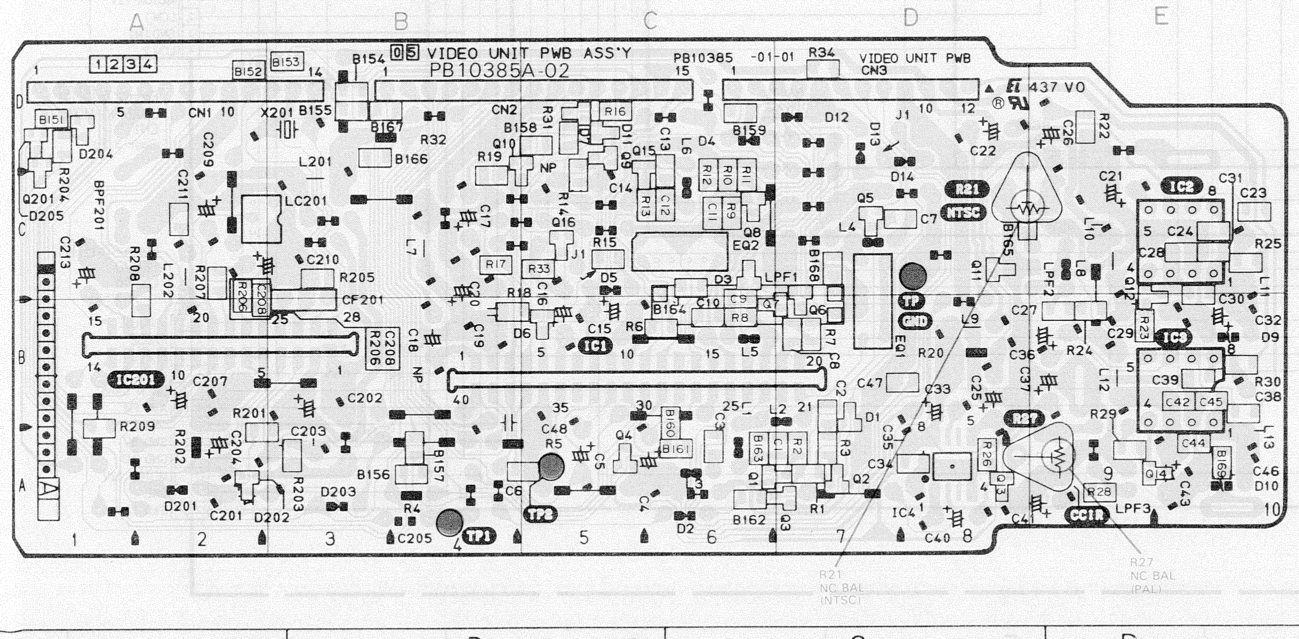
03 AUDIO (MAIN)
Q1, Q2 2SC1740S(RS)
Q4 DTA124ES
Q5 DTA114ES
Q7～Q9 DTA124ES
Q10, Q11, Q13 DTC124ES
From 03 MAIN (VIDEO) (Page 3-28)
J1
SP
AUDIO MUTE
SWD 12V
EE
REC START
REC
From 03 MAIN (VIDEO) J103 (Page 3-29)
J301
NTSC
AUX
D1
D2
D3
D4
D5 UZ5.1BSB
D6
R50 10K
SWD12V
R2 3.3K
R3 2.2K
R4 47K
R5 3.3K
R6 6.8K
R7 3.3K
R8 9.1
R9 1.2K
R10 1.2K
R11 1K
R12 15K
R13 12K
R14 22K
R15 22K
R16 22K
R17 10K
R18 22K
R19 18K
R20 100K
R21 100K
R22 18K
R23 22K
R24 33K
R25 150
R26 1.2K
R27 15K
R28 3.9K
R29 390
R30 150
R33 560
R34 22K
R35 330
R36 330K
R37 10K
R39 3.9M
R40 8.2K
R41 27K
R42 68K
R43 15K
R44 6.8
R45 3.9M
R48 4.7M
R52 10K
R53 3.3K
C1 0.01
C2 1/50
C3 47/16
C4 47/16
C5 1/50
C6 0.027
C7 0.012
C8 0.047
C9 0.056
C10 3.3/25
C11 0.022
C12 0.0012
C13 0.0022
C14 0.33/50
C15 1/10
C16 6.8/16
C17 0.01
C18 1/50
C20 0.0027
C21 10/16
C22 0.0082
C23 330P
C24 0.047
C25 10/16
C26 0.0027
C27 0.0039
C30 0.001
C704 560
C705 0.001
L1 6.8m
L2 10m
L3 470
L703 5.6
L704 5.6
K701
K702
CP1 ICP-F10
GND VA3
J2
J302
AUDIO LINE OUT
AUDIO LINE IN
From/To 03 MAIN (VIDEO)
AUDIO VA1
AUDIO AV1
12 A/CTL HEAD
CN1
CN101
CN102
REC/PB
AUDIO ERASE
FULL ERASE
R42 AUDIO BIAS
T1
TP31 (+)
TP32 (−)
BIAS
TP33 ERASE
REC 0.01 Vp-p
REC 0.005 Vp-p
REC 50 Vp-p
REC 3 Vp-p
REC 0.03 Vp-p
PB 0.07 Vp-p
Q1
Q2
Q4
Q5
Q6
Q7
Q8
Q9
Q10
Q11
Q12
Q13
IC1
EE : H REC : L
HEAD SW 1
RIPPLE FILTER
Vcc
PB : H EE : L
MUTE : H
NTSC SP : L EP : H
GND
PAL
SP : L LP : H
POWER ON/OFF MUTE
REC/EE CONT
RIPPLE FILTER
PB/EE CONT
EP SW CONT
LP SW CONT
MUTING CONT
REC AMP
REC MUTE
EE REC
PB
LINE AMP
PB MUTE
ALC
EE MUTE
ALC DET
EQ AMP
CURRENT PROTECTOR
REC Vcc OUT
RIPPLE FILTER OUT
HEAD SW 12V
ALC FILTER
ALC DET IN
Q12 2SC1740S(QRS)
Q6 2SB810HJ
IC1 LA7295
1 2 3 4 5
A B C D E F G H

3.17 MAIN (AUDIO/VIDEO), JUMP DET AND VIDEO UNIT CIRCUIT BOARDS

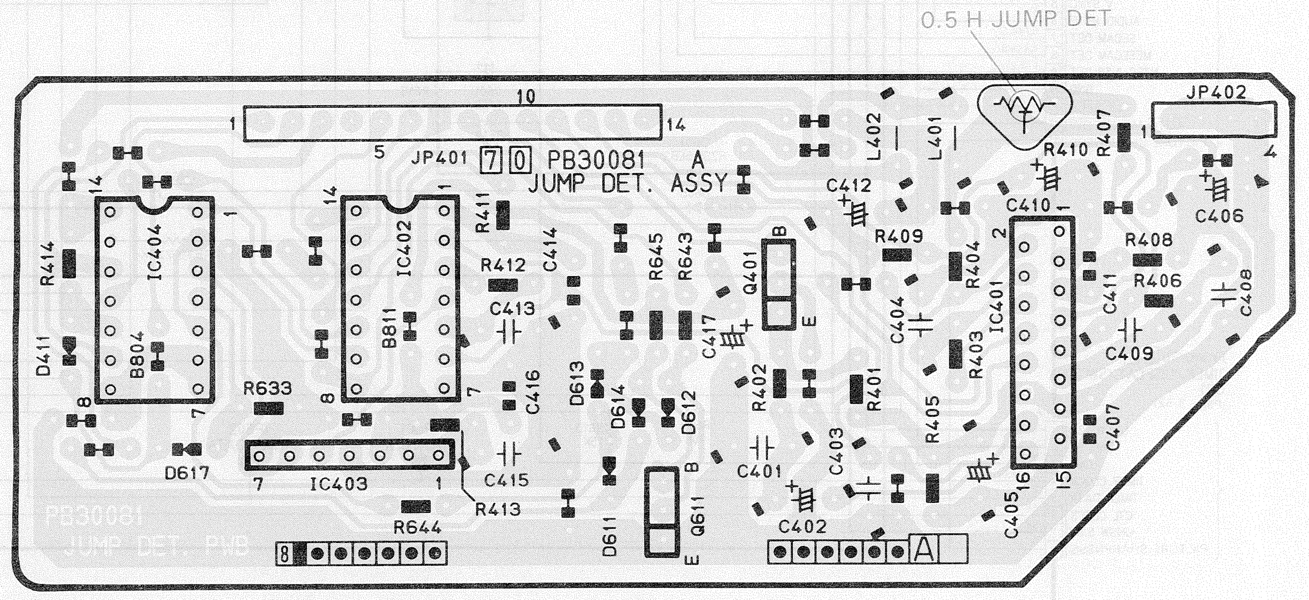
—MAIN—


R42
BIAS VOLTAGE
R506
LP/EP PB EQ
R362
SP PB EQ
R514
DELAYED COLOUR
MAIN PWB ASS'Y
PB10383
PB10383 -01-03
MAIN PWB
PU61240
MAIN UNIT ASS'Y
R504
LP/EP REC EQ
R327
REC COL
R311
PAL REC COL
R324
SECAM REC COL

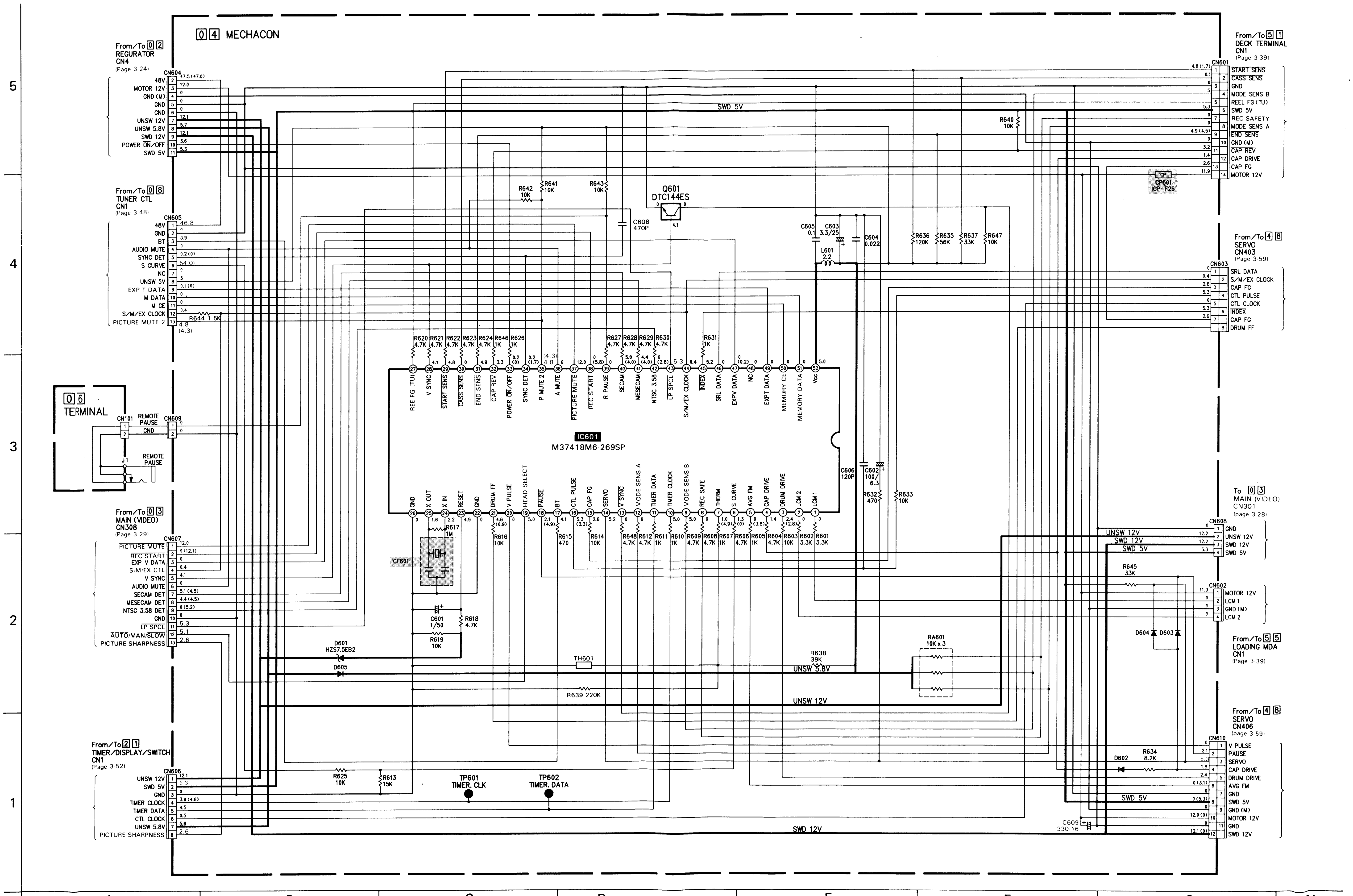
—VIDEO UNIT—


VIDEO UNIT PWB ASS'Y
PB10385 -01-01
PB10385A-02
VIDEO UNIT PWB
R21
NC BAL
(NTSC)
R27
NC BAL
(PAL)

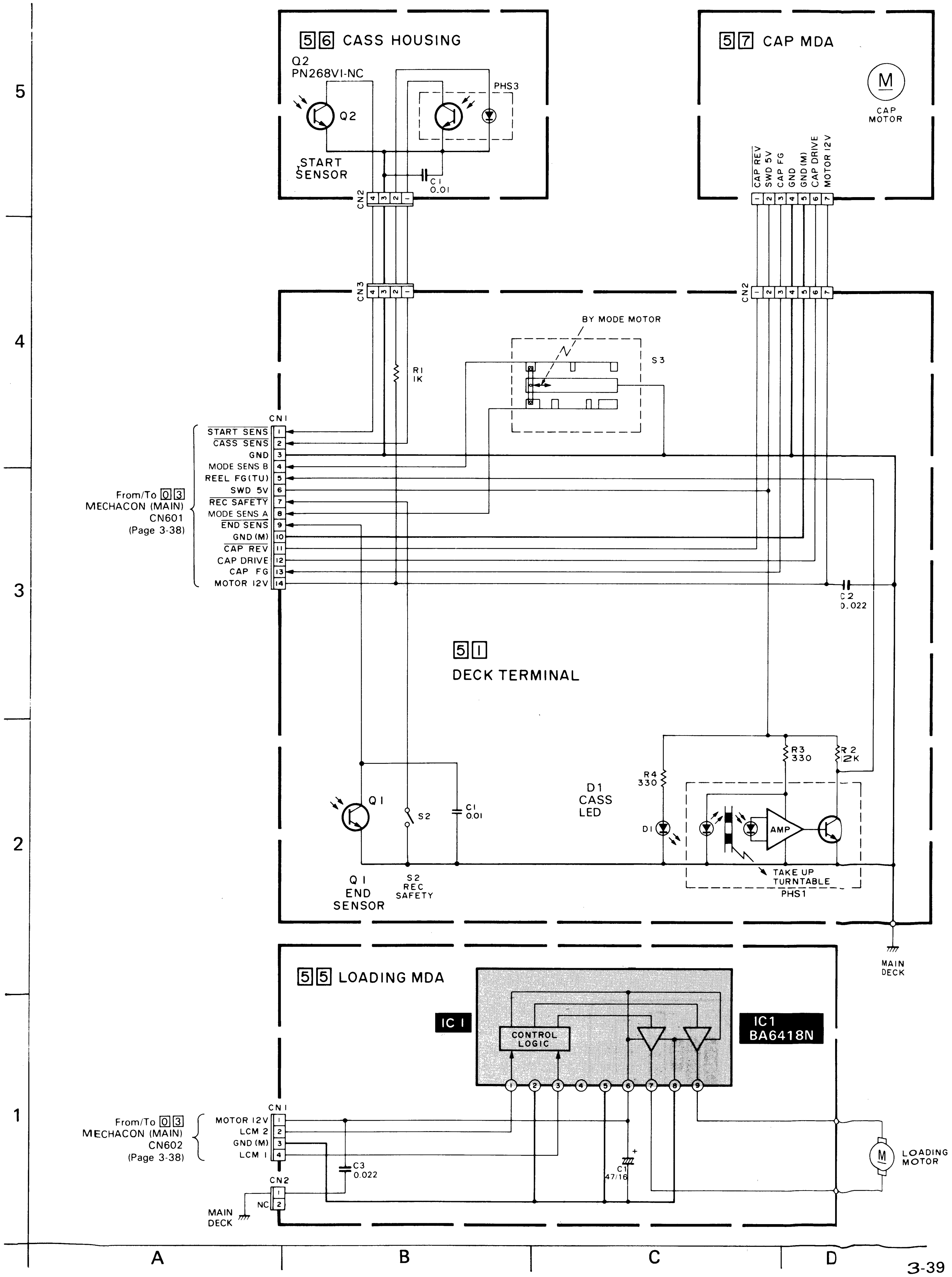
—JUMP DET—


0.5 H JUMP DET
PB30081 A
JUMP DET. ASSY
PB30081
JUMP DET. PWB

3.18 MECHANISM CONTROL SCHEMATIC DIAGRAM


04 MECHACON
From/To 02 REGURATOR CN4 (Page 3 24)
CN604
48V
MOTOR 12V
GND (M)
GND
GND
UNSW 12V
UNSW 5.8V
SWD 12V
POWER ON/OFF
SWD 5V
From/To 08 TUNER CTL CN1 (Page 3 48)
CN605
48V
GND
BT
AUDIO MUTE
SYNC DET
S CURVE
NC
UNSW 5V
EXP T DATA
M DATA
M CE
S/M/EX CLOCK
PICTURE MUTE 2
R644 1.5K
06 TERMINAL
CN101
REMOTE PAUSE
GND
CN609
J1
REMOTE PAUSE
From/To 03 MAIN (VIDEO) CN308 (Page 3 29)
CN607
PICTURE MUTE
REC START
EXP V DATA
S/M/EX CTL
V SYNC
AUDIO MUTE
SECAM DET
MESECAM DET
NTSC 3.58 DET
GND
LP SPCL
AUTO/MAN/SLOW
PICTURE SHARPNESS
From/To 21 TIMER/DISPLAY/SWITCH CN1 (Page 3 52)
CN606
UNSW 12V
SWD 5V
GND
TIMER CLOCK
TIMER DATA
CTL CLOCK
UNSW 5.8V
PICTURE SHARPNESS
SWD 5V
R642 10K
R641 10K
R643 10K
Q601 DTC144ES
C608 470P
C605 0.1
C603 3.3/25
C604 0.022
L601 2.2
R636 120K
R635 56K
R637 33K
R647 10K
R640 10K
CP601 ICP-F25
R620 4.7K
R621 4.7K
R622 4.7K
R623 4.7K
R624 4.7K
R646 1K
R626 1K
R627 4.7K
R628 4.7K
R629 4.7K
R630 4.7K
R631 1K
REE FG (TU)
V SYNC
START SENS
CASS SENS
END SENS
CAP REV
POWER ON/OFF
SYNC DET
P MUTE 2
A MUTE
PICTURE MUTE
REC START
R PAUSE
SECAM
MESECAM
NTSC 3.58
LP SPCL
S/M/EX CLOCK
INDEX
SRL DATA
EXPV DATA
NC
EXPT DATA
MEMORY CE
MEMORY DATA
Vcc
IC601
M37418M6-269SP
GND
X OUT
X IN
RESET
GND
DRUM FF
V PULSE
HEAD SELECT
PAUSE
BT
CTL PULSE
CAP FG
SERVO
V SYNC
MODE SENS A
TIMER DATA
TIMER CLOCK
MODE SENS B
REC SAFE
THERM
S CURVE
AVG FM
CAP DRIVE
DRUM DRIVE
LCM 2
LCM 1
C606 120P
C602 100/6.3
R632 470
R633 10K
R617 1M
CF601
R616 10K
R615 470
R614 10K
R648 4.7K
R612 4.7K
R611 1K
R610 1K
R609 4.7K
R608 4.7K
R607 1K
R606 4.7K
R605 1K
R604 4.7K
R603 10K
R602 3.3K
R601 3.3K
C601 1/50
R618 4.7K
R619 10K
D601 HZS7.5EB2
D605
TH601
R639 220K
R638 39K
UNSW 5.8V
RA601 10K x 3
UNSW 12V
R625 10K
R613 15K
TP601 TIMER. CLK
TP602 TIMER. DATA
SWD 12V
SWD 5V
C609 330 16
From/To 51 DECK TERMINAL CN1 (Page 3 39)
CN601
START SENS
CASS SENS
GND
MODE SENS B
REEL FG (TU)
SWD 5V
REC SAFETY
MODE SENS A
END SENS
GND (M)
CAP REV
CAP DRIVE
CAP FG
MOTOR 12V
From/To 48 SERVO CN403 (Page 3 59)
CN603
SRL DATA
S/M/EX CLOCK
CAP FG
CTL PULSE
CTL CLOCK
INDEX
CAP FG
DRUM FF
To 03 MAIN (VIDEO) CN301 (page 3 28)
CN608
GND
UNSW 12V
SWD 12V
SWD 5V
R645 33K
CN602
MOTOR 12V
LCM 1
GND (M)
LCM 2
D604
D603
From/To 55 LOADING MDA CN1 (Page 3 39)
From/To 48 SERVO CN406 (page 3 59)
CN610
V PULSE
PAUSE
SERVO
CAP DRIVE
DRUM DRIVE
AVG FM
GND
SWD 5V
GND (M)
MOTOR 12V
GND
SWD 12V
D602
R634 8.2K
A
B
C
D
E
F
G
H
1
2
3
4
5

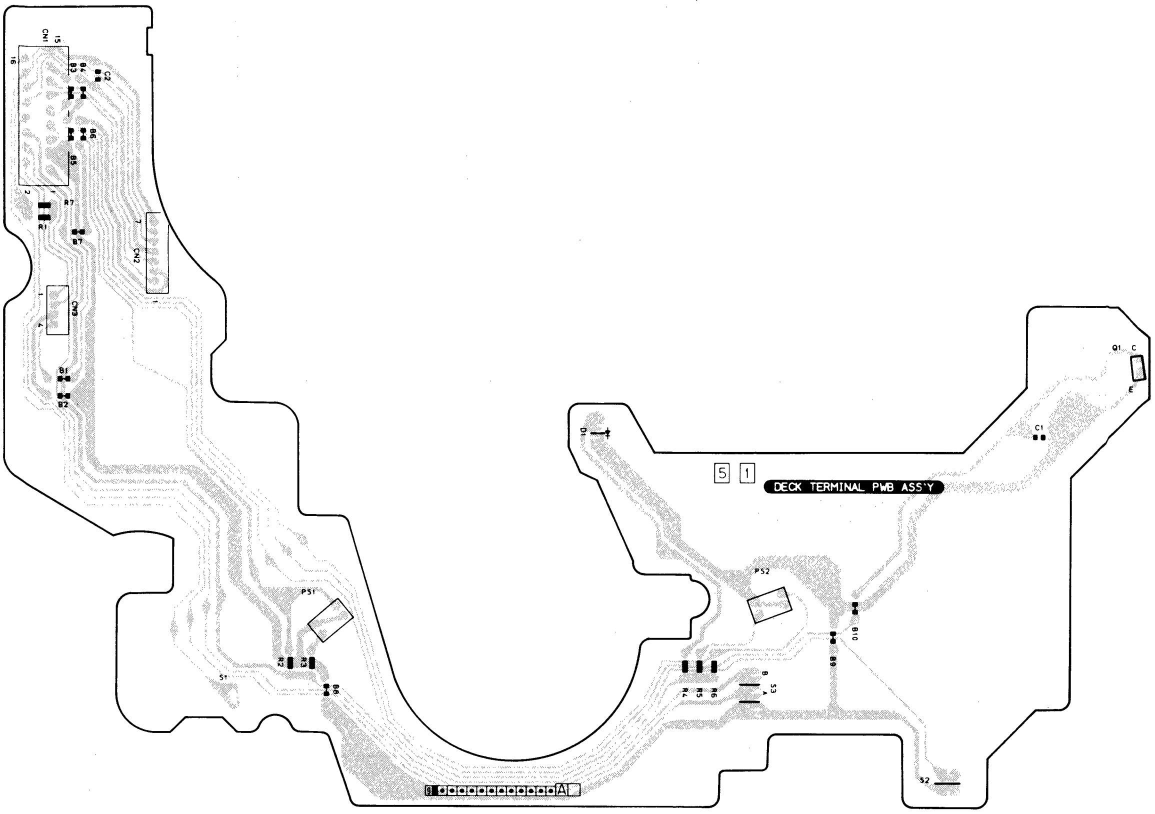
3.19 DECK TERMINAL, CASSETTE HOUSING, CAPSTAN MDA AND LOADING MDA SCHEMATIC DIAGRAMS



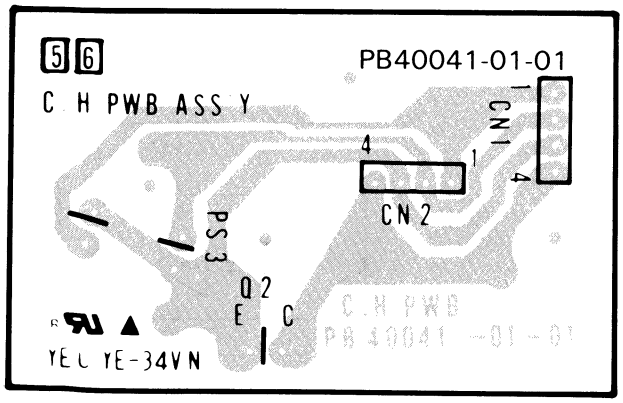
5 6 CASS HOUSING
Q2
PN268V1-NC
Q2
PHS3
START SENSOR
C1
0.01
CN2
4 3 2 1
5 7 CAP MDA
M
CAP MOTOR
CAP REV
SWD 5V
CAP FG
GND
GND (M)
CAP DRIVE
MOTOR 12V
1 2 3 4 5 6 7
CN3
CN2
BY MODE MOTOR
S3
R1
1K
CN1
START SENS
CASS SENS
GND
MODE SENS B
REEL FG(TU)
SWD 5V
REC SAFETY
MODE SENS A
END SENS
GND (M)
CAP REV
CAP DRIVE
CAP FG
MOTOR 12V
From/To 0 3
MECHACON (MAIN)
CN601
(Page 3-38)
C2
0.022
5 1
DECK TERMINAL
R3
330
R2
2K
R4
330
D1
CASS
LED
D1
Q1
S2
C1
0.01
AMP
TAKE UP
TURNTABLE
PHS1
Q1
END
SENSOR
S2
REC
SAFETY
MAIN
DECK
5 5 LOADING MDA
IC1
CONTROL
LOGIC
IC1
BA6418N
1 2 3 4 5 6 7 8 9
CN1
MOTOR 12V
LCM 2
GND (M)
LCM 1
From/To 0 3
MECHACON (MAIN)
CN602
(Page 3-38)
C3
0.022
C1
47/16
+
CN2
NC
MAIN
DECK
M
LOADING
MOTOR
5
4
3
2
1
A
B
C
D

3.20 DECK TERMINAL, LOADING MDA, CASSETTE HOUSING AND A/CTL HEAD CIRCUIT BOARDS

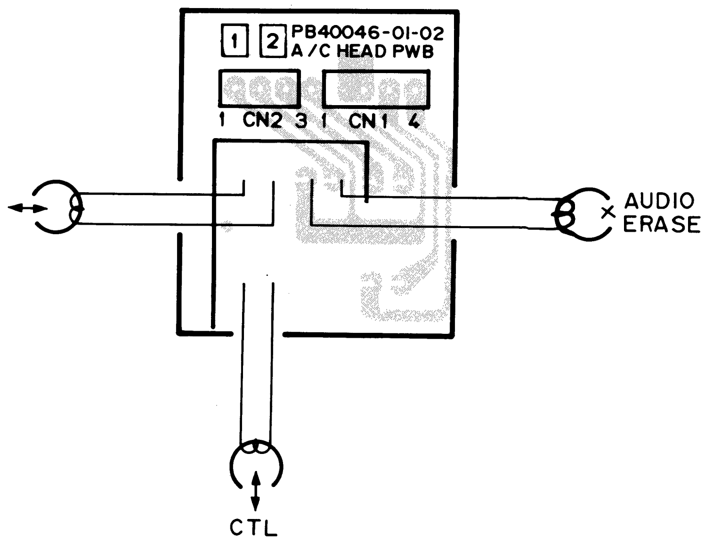
—DECK TERMINAL—


CN1
CN2
CN3
B1
B2
B3
B4
B5
B6
B7
B8
B9
B10
C2
R1
R2
R3
R4
R5
R6
R7
PS1
PS2
S1
S2
S3
D1
Q1
C1
5 1
DECK TERMINAL PWB ASS'Y
A

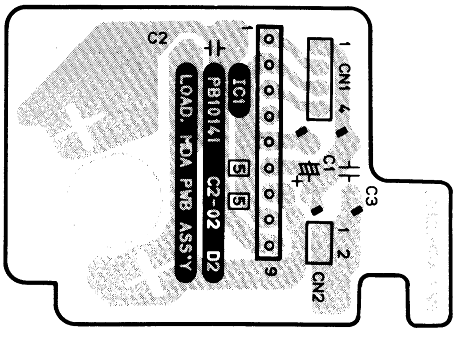
—CASSETTE HOUSING—


5 6
PB40041-01-01
C H PWB ASS Y
1
CN1
4
4
1
CN 2
PS3
Q2
E
C
YEC YE-34VN
C.H PWB
PB 40041 -01-01

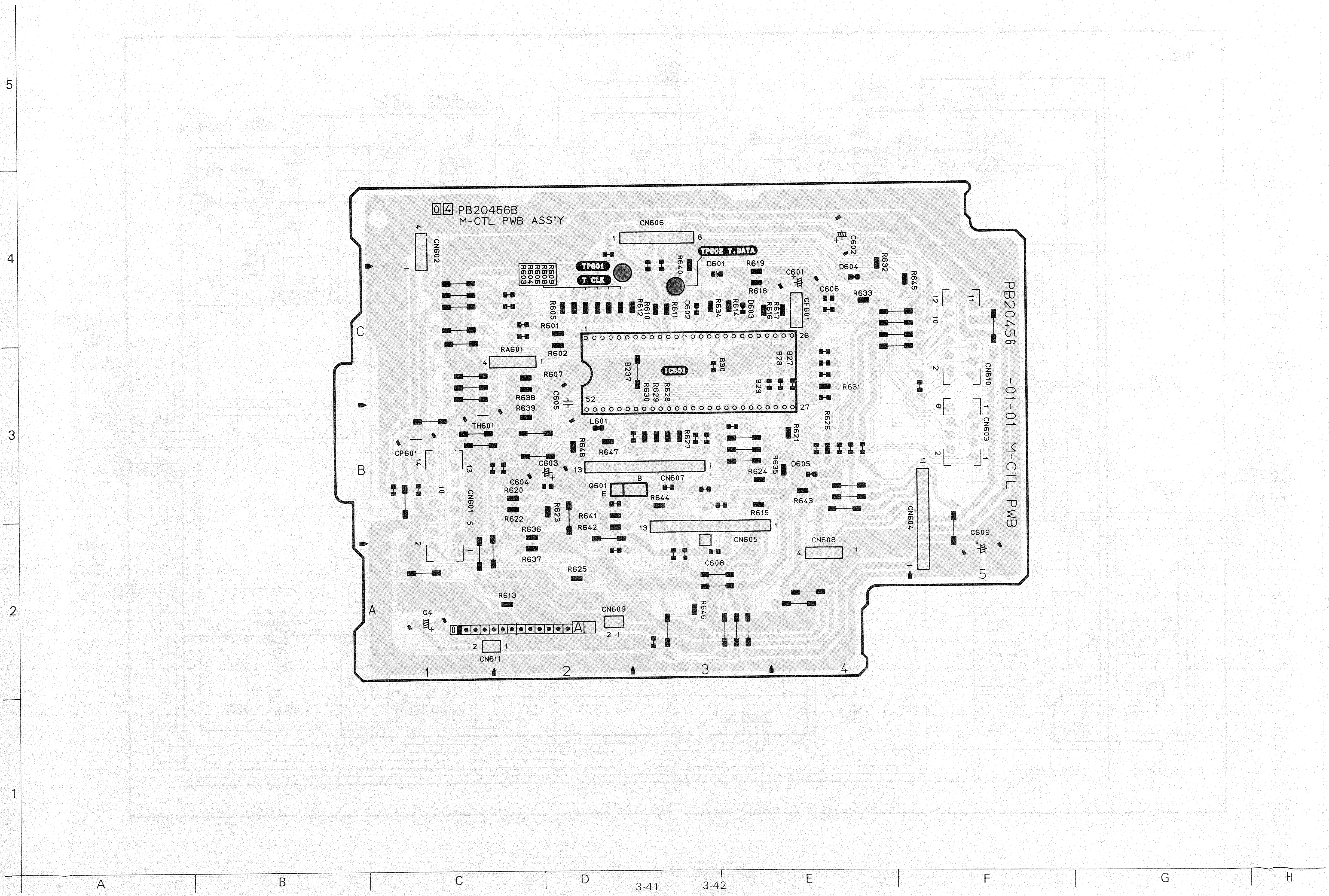
—A/CTL HEAD—


1 2 PB40046-01-02
A/C HEAD PWB
1 CN2 3
1 CN1 4
AUDIO
ERASE
CTL

—LOADING MDA—

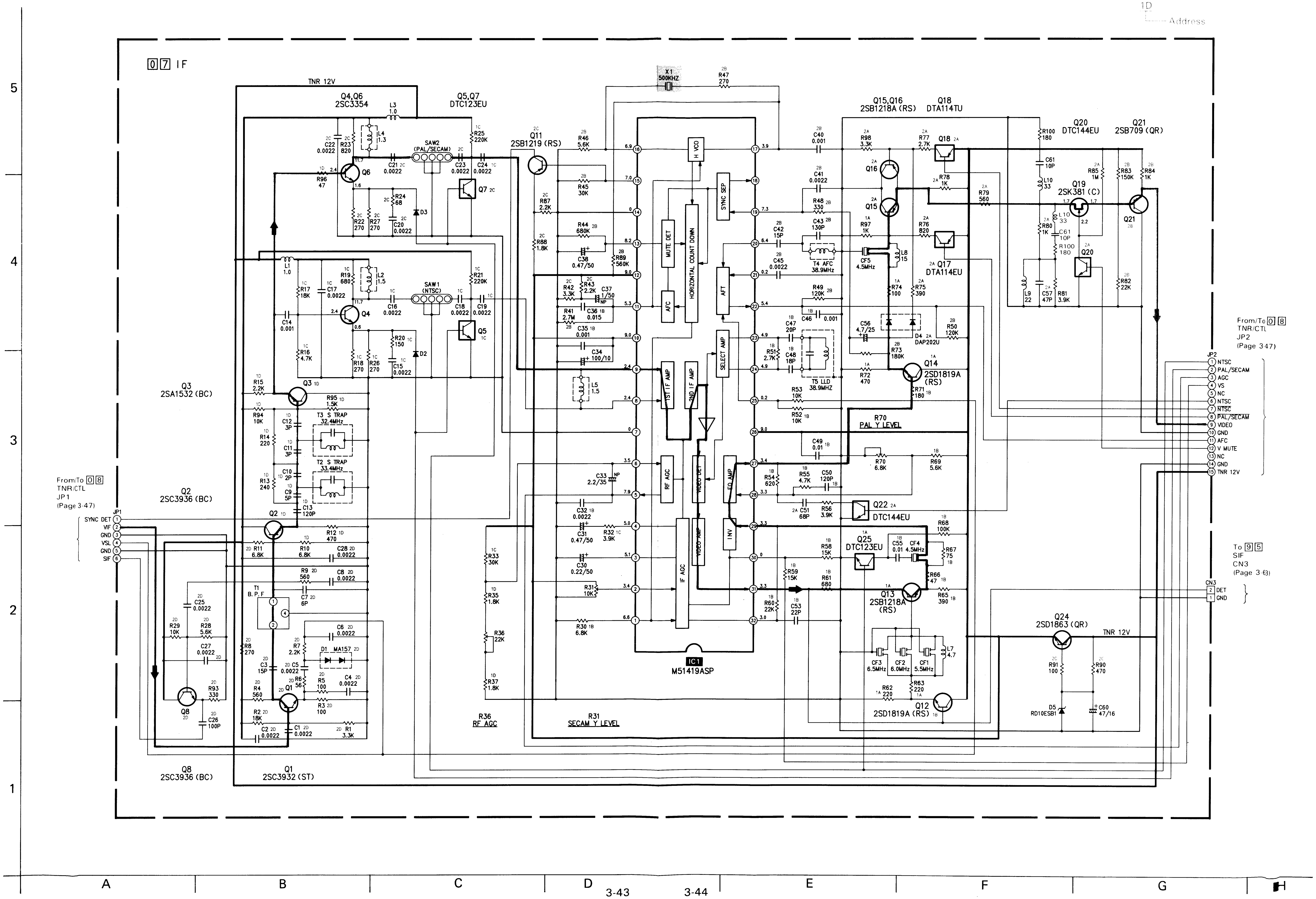

C2
IC1
PB10141
C2-02
D2
LOAD. MDA PWB ASS'Y
5 5
1
9
1 CN1 4
C1
C3
1 2
CN2

3.21 MECHANISM CONTROL CIRCUIT BOARD


04 PB20456B
M-CTL PWB ASS'Y
PB20456 -01-01 M-CTL PWB
IC601
TP601 T CLK
TP602 T.DATA
CN601
CN602
CN603
CN604
CN605
CN606
CN607
CN608
CN609
CN610
CN611
CP601
CF601
RA601
TH601
L601
Q601
D601
D602
D603
D604
D605
C4
C601
C602
C603
C604
C605
C606
C608
C609
R601
R602
R603
R604
R605
R606
R607
R608
R609
R610
R611
R612
R613
R614
R615
R616
R617
R618
R619
R620
R621
R622
R623
R624
R625
R626
R627
R628
R629
R630
R631
R632
R633
R634
R635
R636
R637
R638
R639
R640
R641
R642
R643
R644
R645
R646
R647
R648
B27
B28
B29
B30
B237
A
B
C
1
2
3
4
5

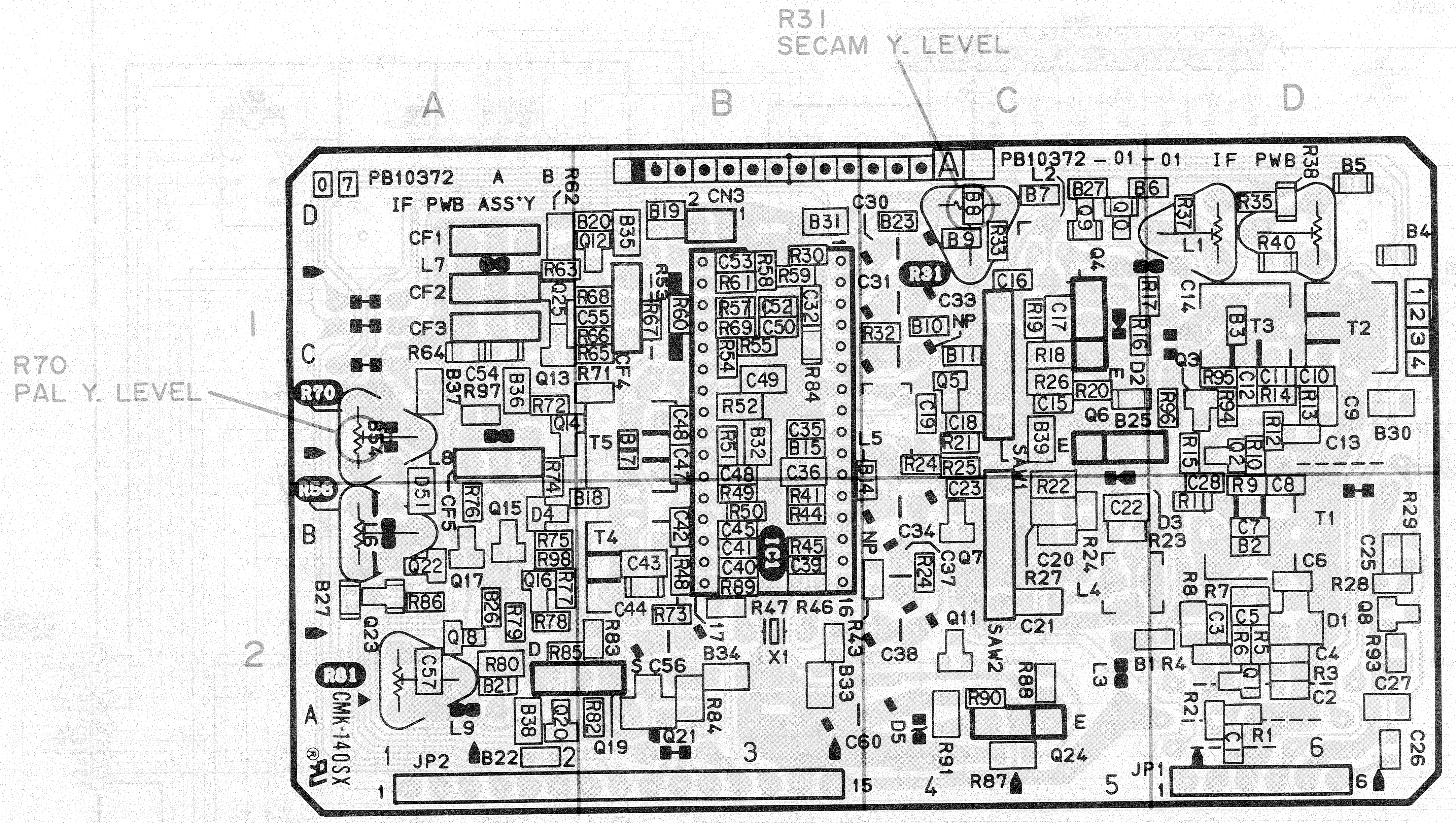
3.22 IF SCHEMATIC DIAGRAM

• Address of chip parts
1D
Address



07 IF
TNR 12V
Q4,Q6 2SC3354
Q5,Q7 DTC123EU
L3 1.0
L4 1.3
SAW2 (PAL/SECAM)
SAW1 (NTSC)
C22 0.0022
R23 820
R25 220K
R96 47
Q6
Q7
C21 0.0022
C23 0.0022
C24 0.0022
R24 68
D3
R22 270
R27 270
C20 0.0022
L1 1.0
R17 18K
C17 0.0022
R19 680
L2 1.5
R21 220K
C16 0.0022
C18 0.0022
C19 0.0022
Q4
Q5
C14 0.001
R16 4.7K
R18 270
R26 270
R20 150
C15 0.0022
D2
Q3 2SA1532 (BC)
R15 2.2K
R95 1.5K
R94 10K
C12 3P
T3 S TRAP 32.4MHz
R14 220
C11 3P
T2 S TRAP 33.4MHz
R13 240
C10 2P
C9 5P
C13 120P
Q2 2SC3936 (BC)
From/To 08 TNR/CTL JP1 (Page 3-47)
SYNC DET
VIF
GND
VSL
GND
SIF
R11 6.8K
R10 6.8K
R12 470
C28 0.0022
R9 560
C8 0.0022
C7 6P
T1 B.P.F
C25 0.0022
R29 10K
R28 5.6K
C27 0.0022
C6 0.0022
R7 2.2K
D1 MA157
R8 270
C3 15P
C5 0.0022
R6 56
R5 100
C4 0.0022
R93 330
C26 100P
R4 560
Q1
R3 100
R2 18K
C2 0.0022
C1 0.0022
R1 3.3K
Q8 2SC3936 (BC)
Q1 2SC3932 (ST)
X1 500KHZ
R47 270
Q11 2SB1219 (RS)
R46 5.6K
R45 30K
R87 2.2K
R44 680K
R88 1.8K
C38 0.47/50
R89 560K
R42 3.3K
R43 2.2K
C37 1/50
R41 2.7M
C36 0.015
C35 0.001
C34 100/10
L5 1.5
C33 2.2/35
C32 0.0022
C31 0.47/50
R32 3.9K
C30 0.22/50
R31 10K
R30 6.8K
R33 30K
R35 1.8K
R36 22K
R37 1.8K
R36 RF AGC
R31 SECAM Y LEVEL
H VCO
SYNC SEP
MUTE DET
HORIZONTAL COUNT DOWN
AFC
AFT
SELECT AMP
1ST IF AMP
2ND IF AMP
RF AGC
VIDEO DET
SD AMP
VIDEO AMP
INV
IF AGC
IC1 M51419ASP
Q15,Q16 2SB1218A (RS)
Q18 DTA114TU
C40 0.001
C41 0.0022
R48 330
C43 130P
C42 15P
C45 0.0022
T4 AFC 38.9MHz
R49 120K
C46 0.001
C47 20P
R51 2.7K
C48 18P
T5 LLD 38.9MHz
R53 10K
R52 10K
C49 0.01
R54 620
R55 4.7K
C50 120P
C51 68P
R56 3.9K
Q22 DTC144EU
R98 3.3K
Q16
Q15
R97 1K
CF5 4.5MHz
L8 15
R77 2.7K
R78 1K
R76 820
Q17 DTA114EU
R74 100
R75 390
C56 4.7/25
D4 DAP202U
R50 120K
R73 180K
R72 470
Q14 2SD1819A (RS)
R71 180
R70 PAL Y LEVEL
R70 6.8K
R69 5.6K
R68 100K
Q25 DTC123EU
C55 0.01
CF4 4.5MHz
R67 75
R58 15K
R59 15K
R61 680
R66 47
R60 22K
C53 22P
Q13 2SB1218A (RS)
R65 390
CF3 6.5MHz
CF2 6.0MHz
CF1 5.5MHz
L7 4.7
R62 220
R63 220
Q12 2SD1819A (RS)
R79 560
Q20 DTC144EU
Q21 2SB709 (QR)
R100 180
C61 10P
L10 33
Q19 2SK381 (C)
R85 1M
R83 150K
R84 1K
R80 1K
L10 33
C61 10P
R100 180
Q20
Q21
L9 22
C57 47P
R81 3.9K
R82 22K
From/To 08 TNR/CTL JP2 (Page 3-47)
JP2
NTSC
PAL/SECAM
AGC
VS
NC
NTSC
NTSC
PAL/SECAM
VIDEO
GND
AFC
V MUTE
NC
GND
TNR 12V
To 95 SIF CN3 (Page 3-63)
CN3
DET
GND
Q24 2SD1863 (QR)
TNR 12V
R91 100
R90 470
D5 RD10ESB1
C60 47/16
A
B
C
D
E
F
G
H
1
2
3
4
5

3.23 IF CIRCUIT BOARD



R31
SECAM Y. LEVEL

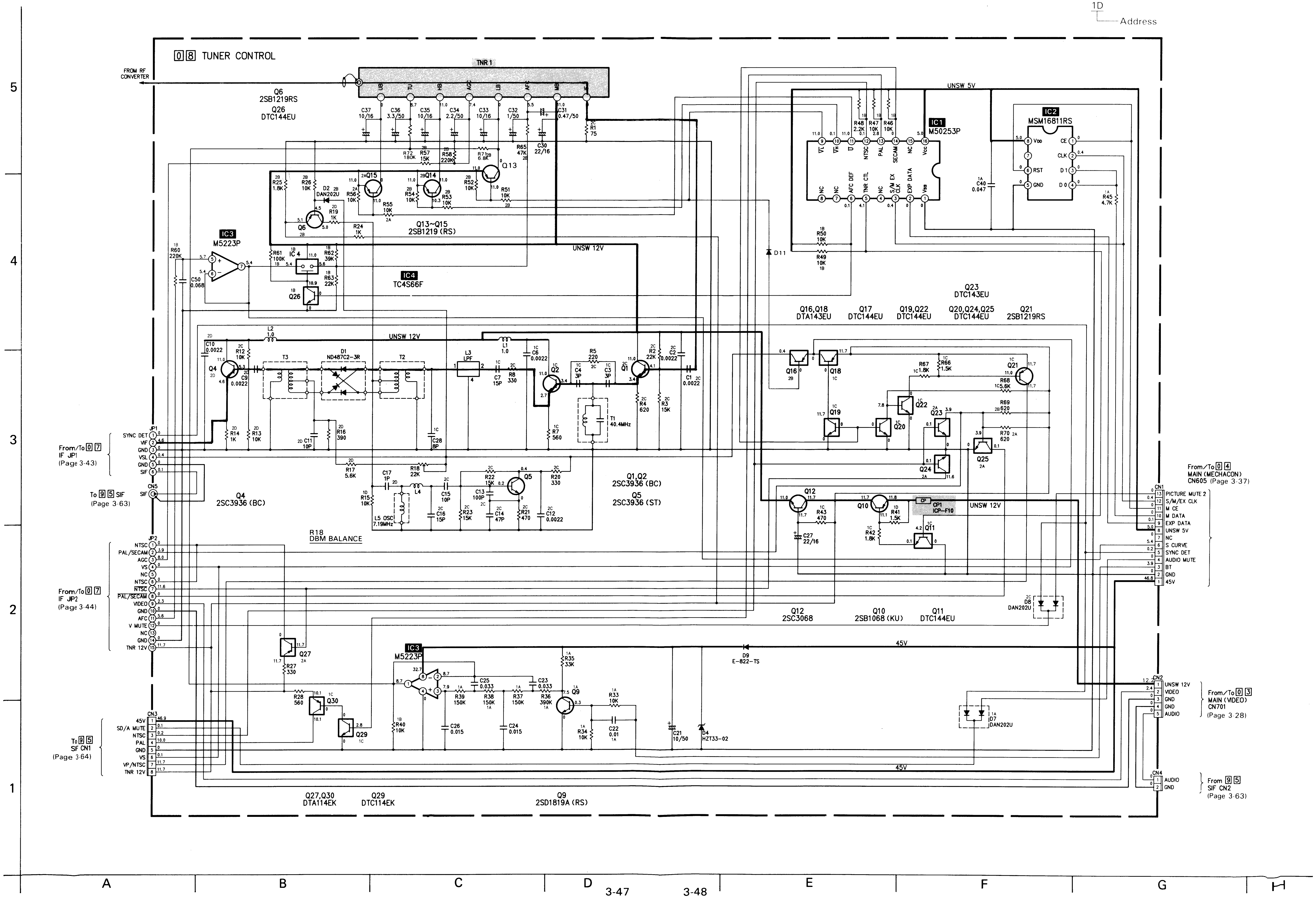
R70
PAL Y. LEVEL

A
B
C
D
1
2
PB10372 A B
IF PWB ASS'Y
PB10372 – 01 – 01 IF PWB
2 CN3 1
JP1
JP2
CMK-140SX
IC1
SAW1
SAW2
X1
T1
T2
T3
T4
T5
CF1
CF2
CF3
CF4
CF5
R31
R70
R56
R81

5
4
3
2
1
A
B
C
D
E
F
G
H

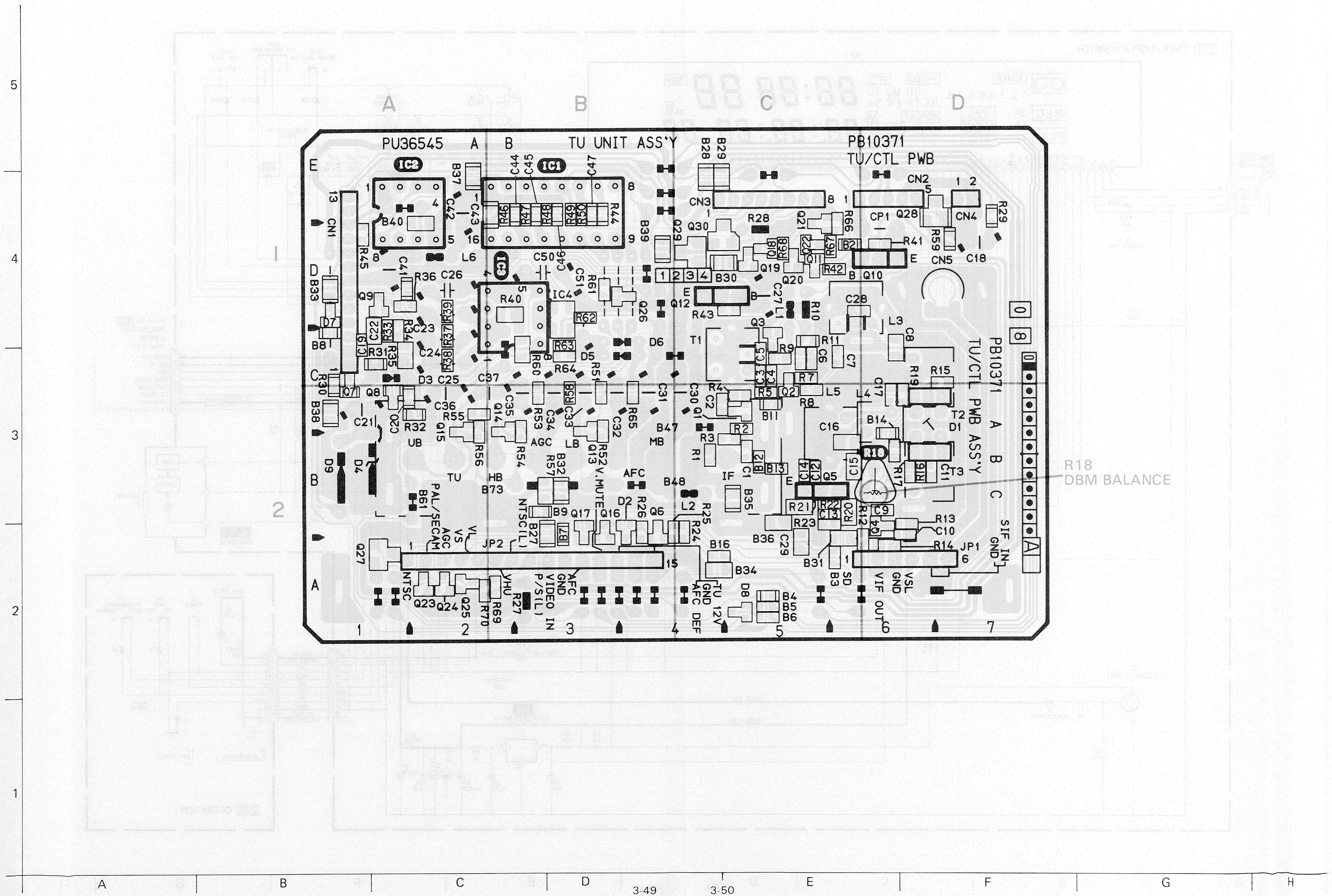
3.24 TUNER CONTROL SCHEMATIC DIAGRAM

• Address of chip parts
1D
└── Address

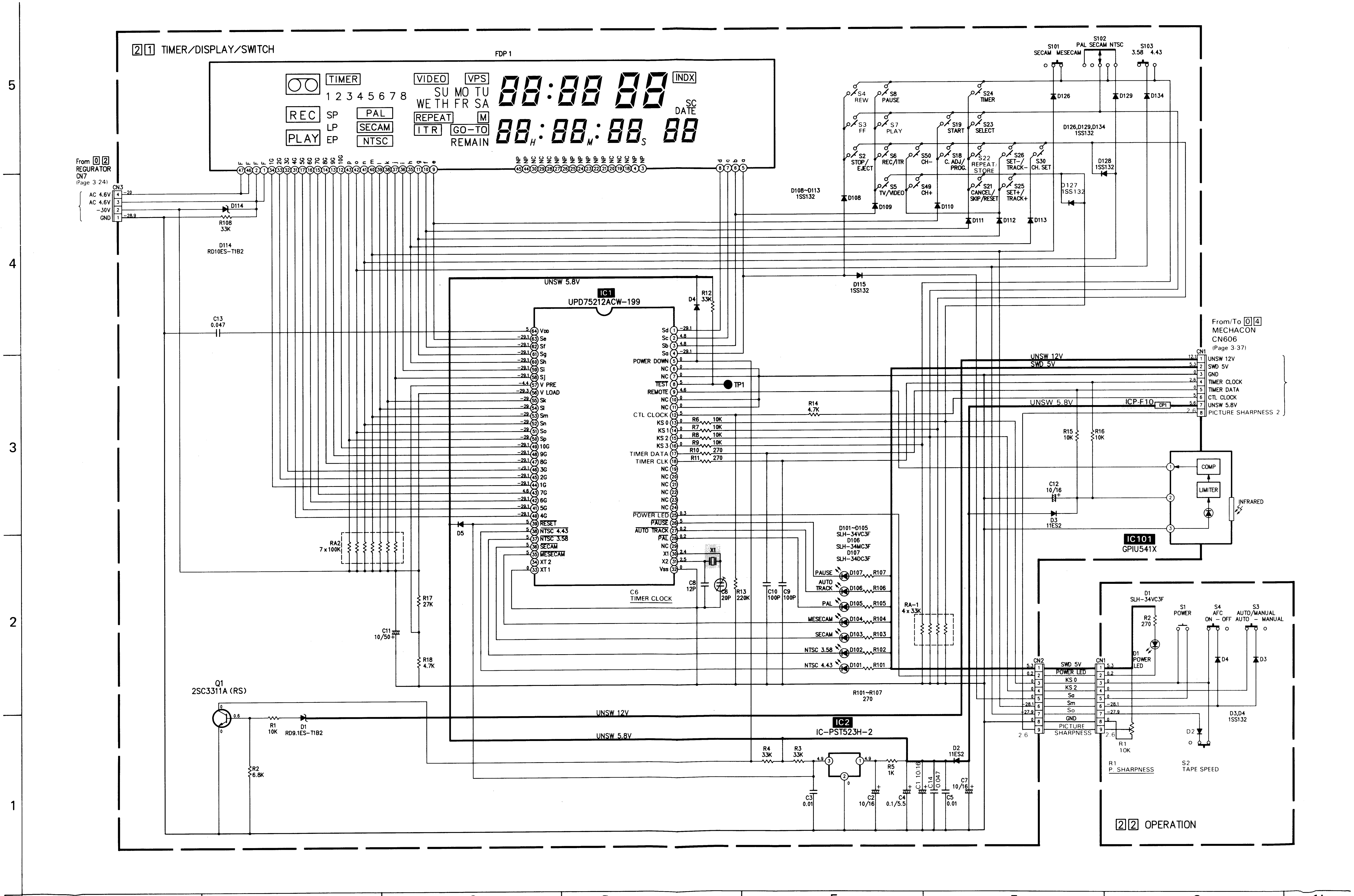


08 TUNER CONTROL
FROM RF CONVERTER
TNR 1
UB TU HB AGC LB AFC MB
Q6 2SB1219RS
Q26 DTC144EU
Q13~Q15 2SB1219 (RS)
IC3 M5223P
IC4 TC4S66F
IC1 M50253P
IC2 MSM16811RS
UNSW 5V
UNSW 12V
Q23 DTC143EU
Q16,Q18 DTA143EU
Q17 DTC144EU
Q19,Q22 DTC144EU
Q20,Q24,Q25 DTC144EU
Q21 2SB1219RS
D1 ND487C2-3R
T3 T2
L3 LPF
T1 40.4MHz
L5 OSC 7.19MHz
Q4 2SC3936 (BC)
Q1,Q2 2SC3936 (BC)
Q5 2SC3936 (ST)
R18 DBM BALANCE
CP1 ICP-F10
Q12 2SC3068
Q10 2SB1068 (KU)
Q11 DTC144EU
D8 DAN202U
D9 E-822-TS
D4 HZT33-02
D7 DAN202U
45V
Q27,Q30 DTA114EK
Q29 DTC114EK
Q9 2SD1819A (RS)
JP1: SYNC DET, VIF, GND, VSL, GND, SIF
From/To 07 IF JP1 (Page 3-43)
CN5 SIF
To 95 SIF (Page 3-63)
JP2: NTSC, PAL/SECAM, AGC, VS, NC, NTSC, NTSC, PAL/SECAM, GND, VIDEO, AFC, V MUTE, NC, GND, TNR 12V
From/To 07 IF JP2 (Page 3-44)
CN3: 45V, SD/A MUTE, NTSC, PAL, GND, VS, VP/NTSC, TNR 12V
To 95 SIF CN1 (Page 3-64)
CN1: PICTURE MUTE 2, S/M/EX CLK, M CE, M DATA, EXP DATA, UNSW 5V, NC, S CURVE, SYNC DET, AUDIO MUTE, BT, GND, 45V
From/To 04 MAIN (MECHACON) CN605 (Page 3-37)
CN2: UNSW 12V, VIDEO, GND, GND, AUDIO
From/To 03 MAIN (VIDEO) CN701 (Page 3-28)
CN4: AUDIO, GND
From 95 SIF CN2 (Page 3-63)
A B C D E F G H
1 2 3 4 5

3.25 TUNER CONTROL CIRCUIT BOARD

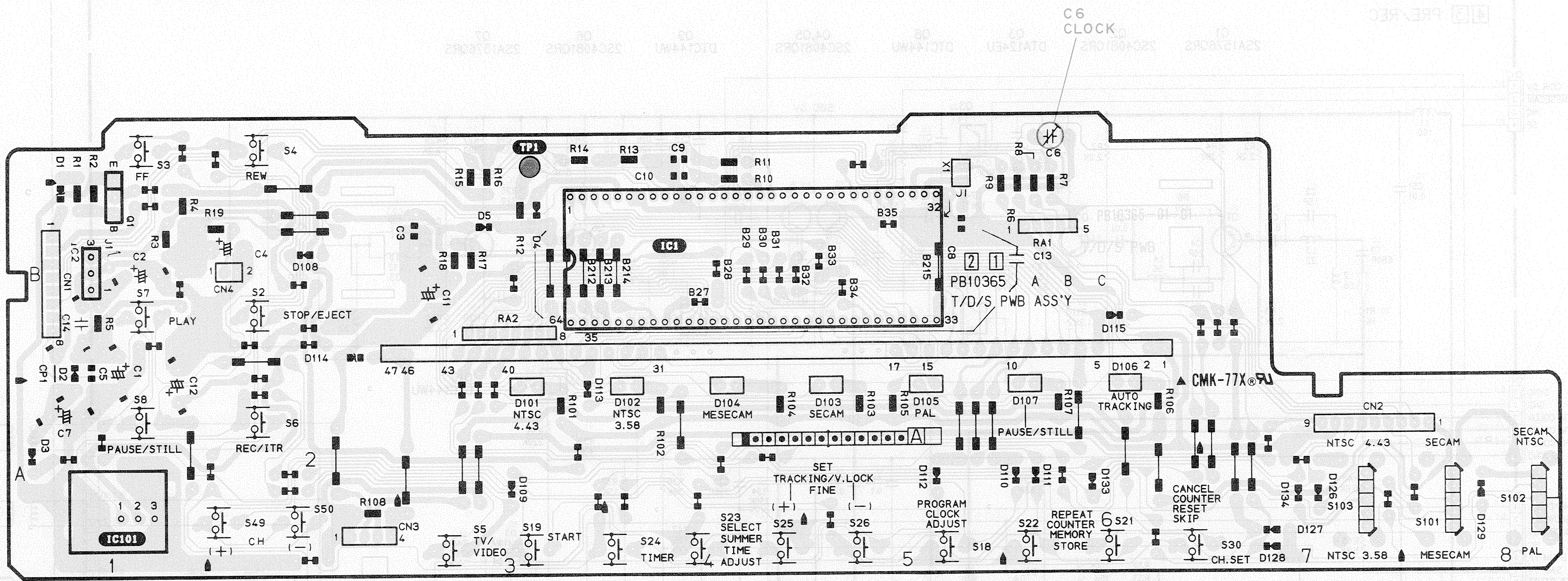

PU36545
TU UNIT ASS'Y
PB10371
TU/CTL PWB
PB10371
TU/CTL PWB ASS'Y
IC1
IC2
IC3
IC4
CN1
CN2
CN3
CN4
CN5
CP1
JP1
JP2
T1
T2
T3
UB
HB
LB
MB
TU
IF
AGC
AFC
V.MUTE
PAL/SECAM
NTSC(L)
NTSC
VHU
VS
VL
AGC
VIDEO IN
P/S(L)
GND
AFC
GND
AFC DEF
TU 12V
SD
VIF OUT
GND
VSL
SIF IN
GND
R18
DBM BALANCE
A
B
C
D
E
1
2
3
4
5
6
7
5
4
3
2
1
A
B
C
D
E
F
G
H

3.26 TIMER/DISPLAY/SWITCH AND OPERATION SCHEMATIC DIAGRAMS

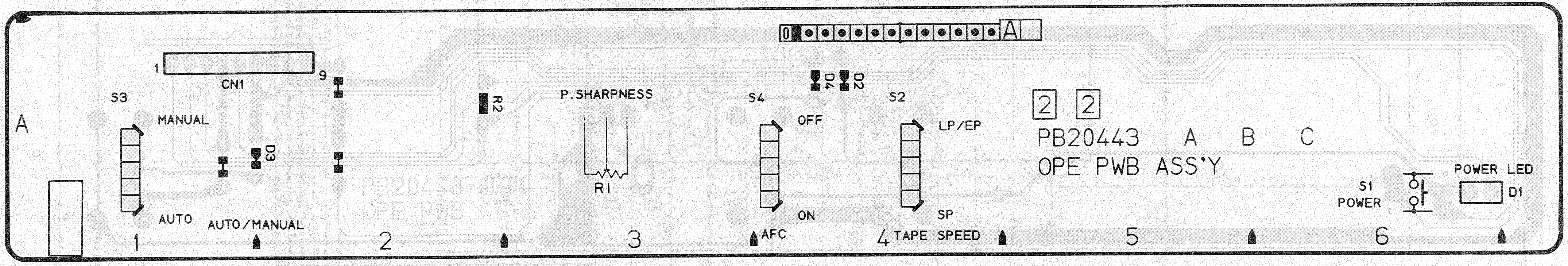

2 1 TIMER/DISPLAY/SWITCH
FDP 1
TIMER
1 2 3 4 5 6 7 8
VIDEO
VPS
SU MO TU
WE TH FR SA
INDX
SC
DATE
REC
SP
LP
EP
PLAY
PAL
SECAM
NTSC
REPEAT
M
ITR
GO-TO
REMAIN
From 0 2
REGURATOR
CN7
(Page 3-24)
CN3
AC 4.6V
AC 4.6V
-30V
GND
D114
R108
33K
D114
RD10ES-T1B2
C13
0.047
UNSW 5.8V
IC1
UPD75212ACW-199
D4
R12
33K
VDD
Se
Sf
Sg
Sh
Si
Sj
V PRE
V LOAD
Sk
Sl
Sm
Sn
So
Sp
10G
9G
8G
3G
2G
1G
7G
6G
5G
4G
RESET
NTSC 4.43
NTSC 3.58
SECAM
MESECAM
XT 2
XT 1
Sd
Sc
Sb
Sa
POWER DOWN
NC
TEST
TP1
REMOTE
CTL CLOCK
KS 0
KS 1
KS 2
KS 3
TIMER DATA
TIMER CLK
POWER LED
PAUSE
AUTO TRACK
PAL
X1
X2
Vss
R6 10K
R7 10K
R8 10K
R9 10K
R10 270
R11 270
C6
TIMER CLOCK
C8
12P
C8
20P
R13
220K
C10
100P
C9
100P
D5
RA2
7 x 100K
R17
27K
C11
10/50
R18
4.7K
Q1
2SC3311A (RS)
R1
10K
D1
RD9.1ES-T1B2
R2
6.8K
UNSW 12V
UNSW 5.8V
IC2
IC-PST523H-2
R4
33K
R3
33K
C3
0.01
C2
10/16
C4
0.1/5.5
C1 10/16
C14 0.047
C5
0.01
C7
10/16
R5
1K
D2
11ES2
D101-D105
SLH-34VC3F
D106
SLH-34MC3F
D107
SLH-34DC3F
D107 R107
D106 R106
D105 R105
D104 R104
D103 R103
D102 R102
D101 R101
MESECAM
SECAM
NTSC 3.58
NTSC 4.43
R101-R107
270
RA-1
4 x 33K
S101
SECAM MESECAM
S102
PAL SECAM NTSC
S103
3.58 4.43
S4 REW
S8 PAUSE
S24 TIMER
S3 FF
S7 PLAY
S19 START
S23 SELECT
S2 STOP/EJECT
S6 REC/ITR
S50 CH-
S18 C. ADJ/PROG.
S22 REPEAT/STORE
S26 SET-/TRACK-
S30 CH. SET
S5 TV/VIDEO
S49 CH+
S21 CANCEL/SKIP/RESET
S25 SET+/TRACK+
D126
D129
D134
D126,D129,D134
1SS132
D128
1SS132
D127
1SS132
D108-D113
1SS132
D108
D109
D110
D111
D112
D113
D115
1SS132
R14
4.7K
From/To 0 4
MECHACON
CN606
(Page 3-37)
CN1
UNSW 12V
SWD 5V
GND
TIMER CLOCK
TIMER DATA
CTL CLOCK
UNSW 5.8V
PICTURE SHARPNESS 2
ICP-F10
CP1
R15
10K
R16
10K
C12
10/16
D3
11ES2
COMP
LIMITER
INFRARED
IC101
GPIU541X
CN2
CN1
SWD 5V
POWER LED
KS 0
KS 2
Sa
Sm
So
GND
PICTURE SHARPNESS
D1
SLH-34VC3F
R2
270
D1
POWER LED
S1
POWER
S4
AFC
ON - OFF
S3
AUTO/MANUAL
AUTO - MANUAL
D4
D3
D3,D4
1SS132
D2
R1
10K
R1
P. SHARPNESS
S2
TAPE SPEED
2 2 OPERATION
5
4
3
2
1
A
B
C
D
E
F
G
H

3.27 TIMER/DISPLAY/SWITCH AND OPERATION CIRCUIT BOARDS

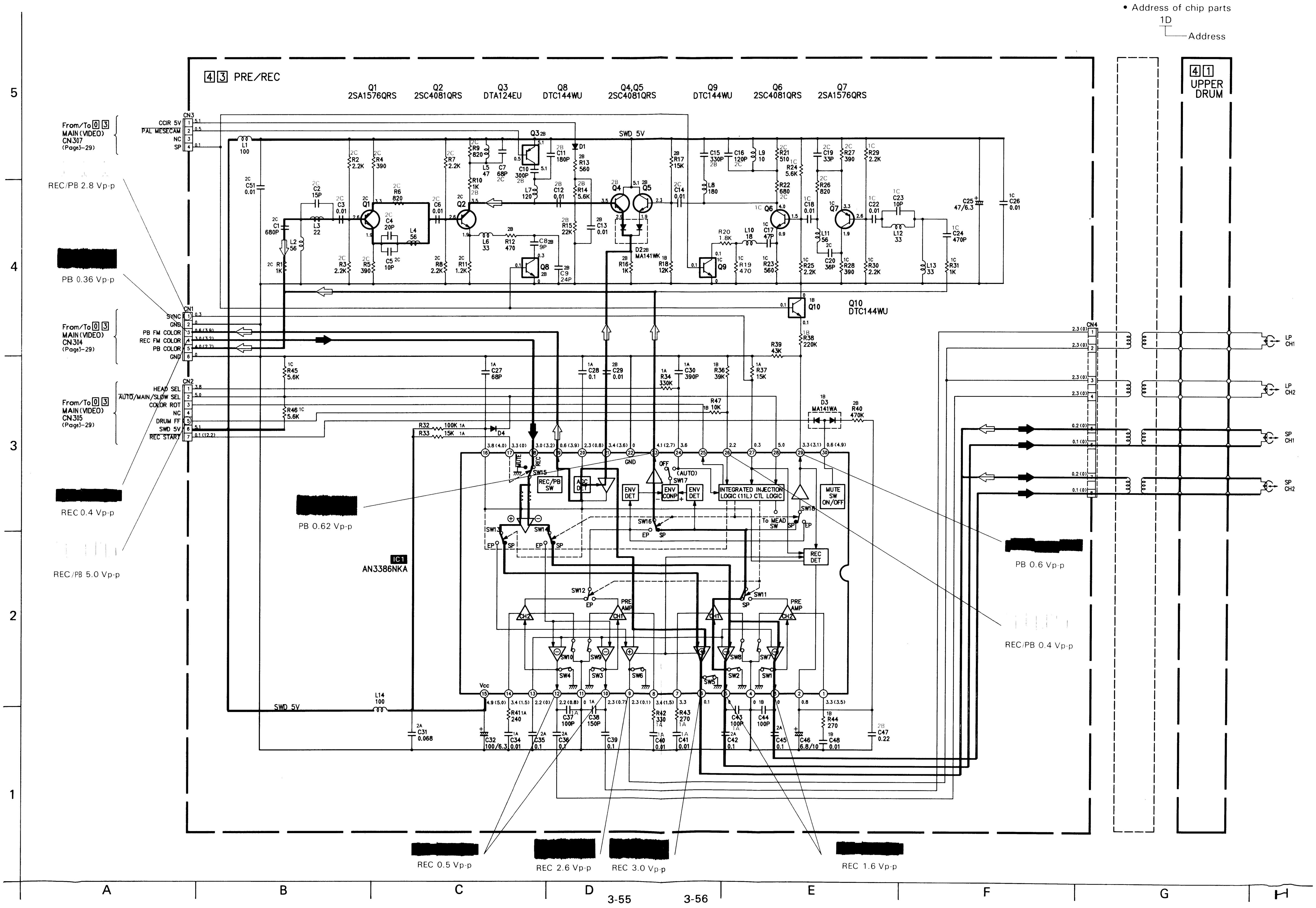
—TIMER/DISPLAY/SWITCH—


C6
CLOCK
TP1
IC1
IC101
PB10365 A B C
T/D/S PWB ASS'Y
CMK-77X
S3 FF
S4 REW
S7 PLAY
S2 STOP/EJECT
S8 PAUSE/STILL
S6 REC/ITR
S49 CH (+)
S50 (−)
S5 TV/VIDEO
S19 START
S24 TIMER
S23 SELECT SUMMER TIME ADJUST
SET TRACKING/V.LOCK FINE
S25 (+)
S26 (−)
PROGRAM CLOCK ADJUST
S18
S22 REPEAT COUNTER MEMORY STORE
S21
CANCEL COUNTER RESET SKIP
S30 CH.SET
D101 NTSC 4.43
D102 NTSC 3.58
D104 MESECAM
D103 SECAM
D105 PAL
D107 PAUSE/STILL
D106 AUTO TRACKING
CN1
CN2
CN3
CN4
RA1
RA2
X1
S103 NTSC 4.43
S101 SECAM
S102 SECAM NTSC
D127 NTSC 3.58
D129 MESECAM
PAL
D128
D134
D126
1
2
3
4
5
6
7
8

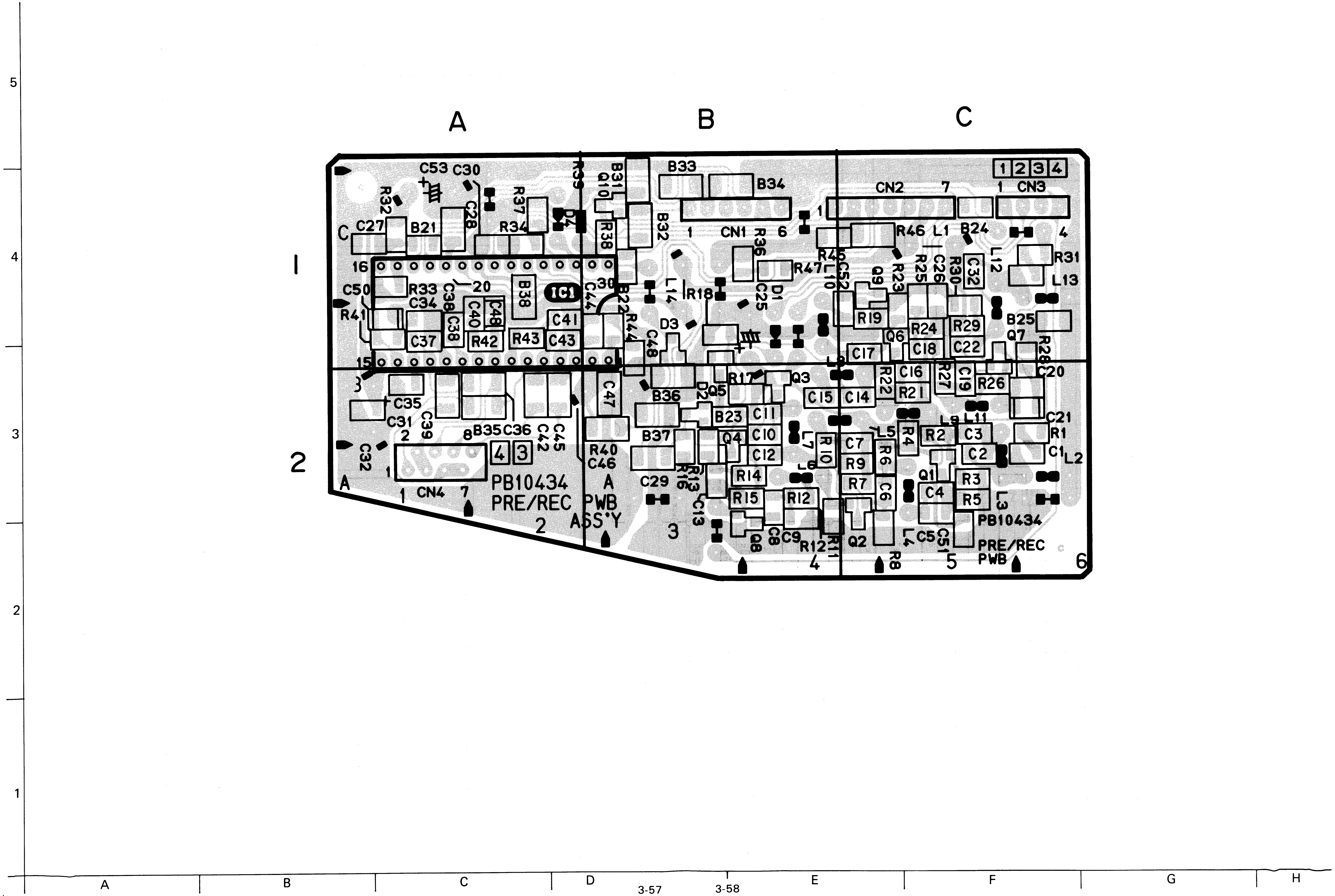
—OPERATION—


CN1
S3 MANUAL
AUTO
D3 AUTO/MANUAL
R2
P.SHARPNESS
R1
S4 OFF
ON
AFC
D2
D4
S2 LP/EP
SP
TAPE SPEED
PB20443 A B C
OPE PWB ASS'Y
PB20443-10-10
OPE PWB
S1 POWER
POWER LED D1
1
2
3
4
5
6

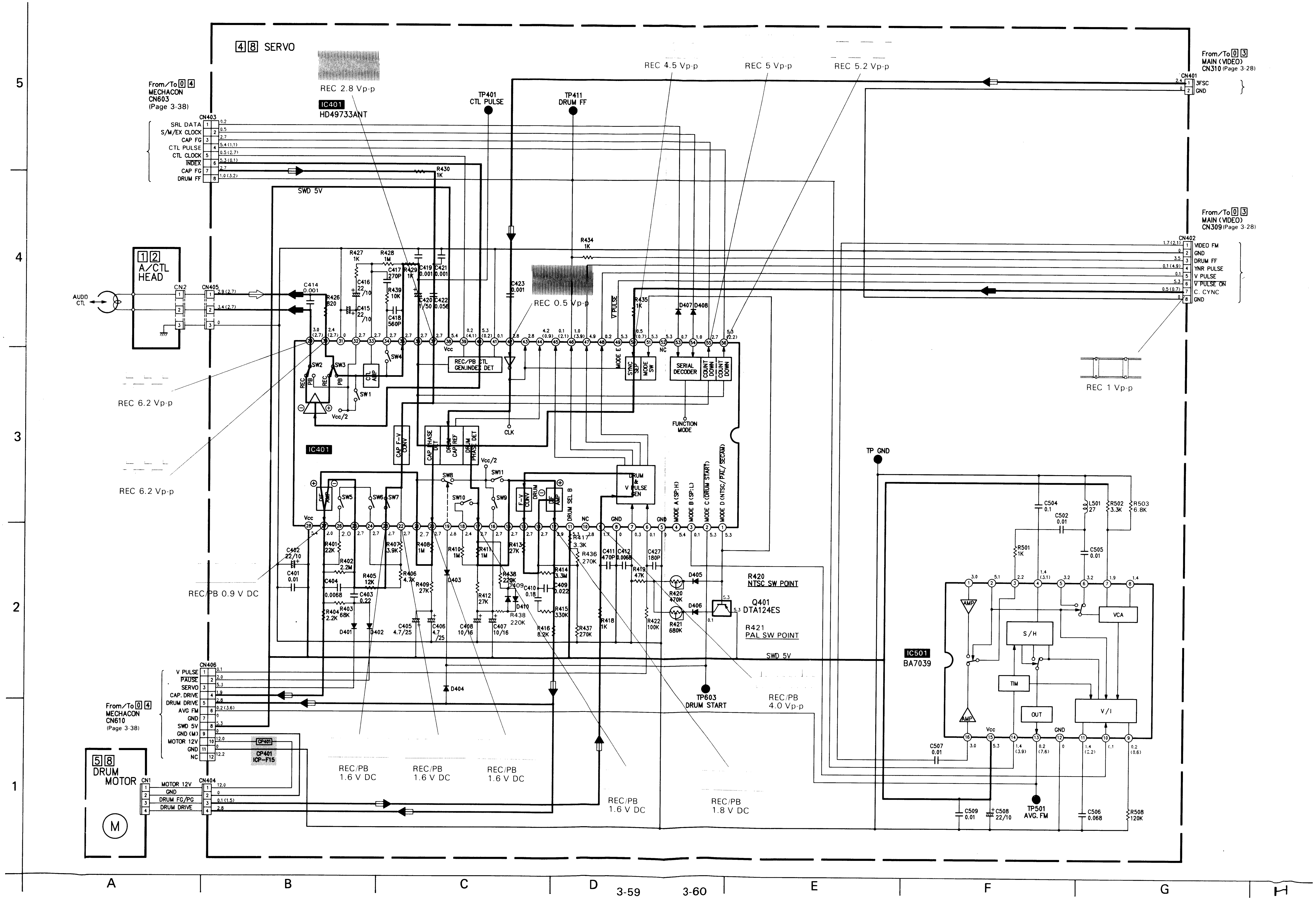
3.28 PRE/REC SCHEMATIC DIAGRAM


• Address of chip parts
1D
Address
4 3 PRE/REC
Q1 2SA1576QRS
Q2 2SC4081QRS
Q3 DTA124EU
Q8 DTC144WU
Q4,Q5 2SC4081QRS
Q9 DTC144WU
Q6 2SC4081QRS
Q7 2SA1576QRS
Q10 DTC144WU
4 1 UPPER DRUM
From/To 0 3 MAIN (VIDEO) CN307 (Page3-29)
CCIR 5V
PAL MESECAM
NC
SP
CN3
From/To 0 3 MAIN (VIDEO) CN304 (Page3-29)
SYNC
GND
PB FM COLOR
REC FM COLOR
PB COLOR
GND
CN1
From/To 0 3 MAIN (VIDEO) CN305 (Page3-29)
HEAD SEL
AUTO/MAIN/SLOW SEL
COLOR ROT
NC
DRUM FF
SWD 5V
REC START
CN2
SWD 5V
REC/PB 2.8 Vp-p
PB 0.36 Vp-p
REC 0.4 Vp-p
REC/PB 5.0 Vp-p
PB 0.62 Vp-p
PB 0.6 Vp-p
REC/PB 0.4 Vp-p
REC 0.5 Vp-p
REC 2.6 Vp-p
REC 3.0 Vp-p
REC 1.6 Vp-p
IC1 AN3386NKA
MUTE
REC
SW15
REC/PB SW
ACC DET
GND
OFF
(AUTO)
SW17
ENV DET
ENV COMP
ENV DET
INTEGRATED INJECTION LOGIC (I2L) CTL LOGIC
MUTE SW ON/OFF
SW18
To HEAD SW
SW16
REC DET
SW13
SW14
SW12
SW11
PRE AMP
CH1
CH2
SW10
SW9
SW8
SW7
SW4
SW3
SW6
SW5
SW2
SW1
EP
SP
Vcc
D1
D2 MA141WK
D3 MA141WA
D4
L1 100
L14 100
CN4
LP CH1
LP CH2
SP CH1
SP CH2
5
4
3
2
1
A
B
C
D
E
F
G
H

3.29 PRE/REC CIRCUIT BOARD

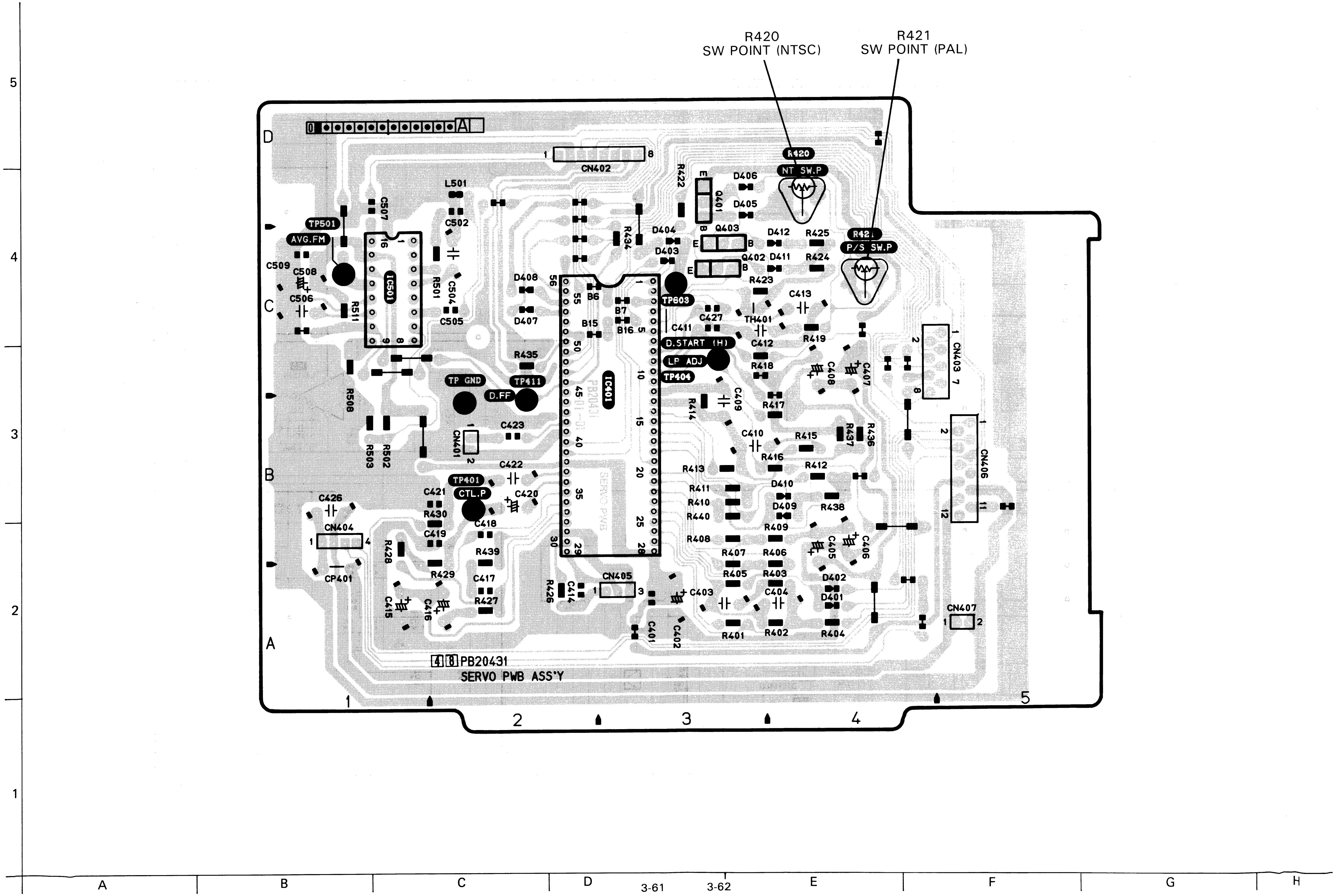

A
B
C
1
2
3
4
5
6
1 2 3 4
CN1
CN2
CN3
CN4
IC1
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10
D1
D2
D3
D4
B21
B22
B23
B24
B25
B31
B32
B33
B34
B35
B36
B37
B38
L1
L2
L3
L4
L5
L6
L7
L8
L9
L10
L11
L12
L13
L14
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R13
R14
R15
R16
R17
R18
R19
R21
R22
R23
R24
R25
R26
R27
R28
R29
R30
R31
R32
R33
R34
R36
R37
R38
R39
R40
R41
R42
R43
R44
R45
R46
R47
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
C21
C22
C25
C26
C27
C28
C29
C30
C31
C32
C34
C35
C36
C37
C38
C39
C40
C41
C42
C43
C44
C45
C46
C47
C48
C50
C51
C52
C53
PB10434
PRE/REC PWB
ASS'Y
PB10434
PRE/REC
PWB
5
4
3
2
1
A
B
C
D
E
F
G
H

3.30 SERVO SCHEMATIC DIAGRAM



48 SERVO
REC 2.8 Vp-p
IC401
HD49733ANT
REC 4.5 Vp-p
REC 5 Vp-p
REC 5.2 Vp-p
From/To 03
MAIN (VIDEO)
CN310 (Page 3-28)
CN401
3FSC
GND
From/To 04
MECHACON
CN603
(Page 3-38)
CN403
SRL DATA
S/M/EX CLOCK
CAP FG
CTL PULSE
CTL CLOCK
INDEX
CAP FG
DRUM FF
TP401
CTL PULSE
TP411
DRUM FF
R430
1K
SWD 5V
From/To 03
MAIN (VIDEO)
CN309 (Page 3-28)
CN402
VIDEO FM
GND
DRUM FF
YNR PULSE
V PULSE
V PULSE ON
C. CYNC
GND
12
A/CTL
HEAD
AUDIO
CTL
CN2
CN405
R434
1K
C414
0.001
R426
820
R427
1K
R428
1M
C416
22/10
C415
22/10
C417
270P
R439
10K
C418
560P
R429
1K
C419
0.001
C421
0.001
C420
1/50
C422
0.056
C423
0.001
REC 0.5 Vp-p
V PULSE
R435
1K
D407
D408
SW2
SW3
SW4
SW1
CTL AMP
REC
PB
Vcc/2
Vcc
REC/PB CTL
GEN.INDEX DET
SYNC SEP
MODE SW
MODE E
SERIAL DECODER
COUNT DOWN
COUNT DOWN
NC
FUNCTION
MODE
CLK
REC 1 Vp-p
REC 6.2 Vp-p
REC 6.2 Vp-p
IC401
CAP F-V CONV
CAP PHASE DET
DRUM CAP REF
DRUM PHASE DET
Vcc/2
SW8
SW11
SW10
SW9
SW5
SW6
SW7
DIF AMP
F-V CONV
DRUM
DIF AMP
DRUM SEL B
DRUM & V PULSE GEN
MODE A (SP:H)
MODE B (SP:L)
MODE C (DRUM START)
MODE D (NTSC/PAL/SECAM)
TP GND
C402
22/10
C401
0.01
R401
22K
R402
2.2M
C404
0.0068
C403
0.22
R404
2.2K
R403
68K
R405
12K
R407
3.9K
R406
4.7K
R409
27K
R408
1M
R410
1M
R411
1M
R413
27K
R412
27K
R438
220K
D409
C410
0.18
D410
R438
220K
R414
3.3M
C409
0.022
R415
330K
R416
8.2K
R417
3.3K
R436
270K
C411
470P
C412
0.0068
R419
47K
C427
180P
R437
270K
R418
1K
R422
100K
D401
D402
D403
D404
C405
4.7/25
C406
4.7/25
C408
10/16
C407
10/16
D405
D406
R420
470K
R421
680K
R420
NTSC SW POINT
Q401
DTA124ES
R421
PAL SW POINT
SWD 5V
REC/PB 0.9 V DC
TP603
DRUM START
REC/PB
4.0 Vp-p
IC501
BA7039
C504
0.1
C502
0.01
L501
27
R502
3.3K
R503
6.8K
R501
1K
C505
0.01
AMP
S/H
VCA
TIM
OUT
V/I
AMP
Vcc
GND
C507
0.01
C509
0.01
C508
22/10
TP501
AVG. FM
C506
0.068
R508
120K
From/To 04
MECHACON
CN610
(Page 3-38)
CN406
V PULSE
PAUSE
SERVO
CAP. DRIVE
DRUM DRIVE
AVG FM
GND
SWD 5V
GND (M)
MOTOR 12V
GND
NC
CP401
CP401
ICP-F15
58
DRUM
MOTOR
CN1
CN404
MOTOR 12V
GND
DRUM FG/PG
DRUM DRIVE
REC/PB
1.6 V DC
REC/PB
1.6 V DC
REC/PB
1.6 V DC
REC/PB
1.6 V DC
REC/PB
1.8 V DC
A
B
C
D
E
F
G
H
1
2
3
4
5

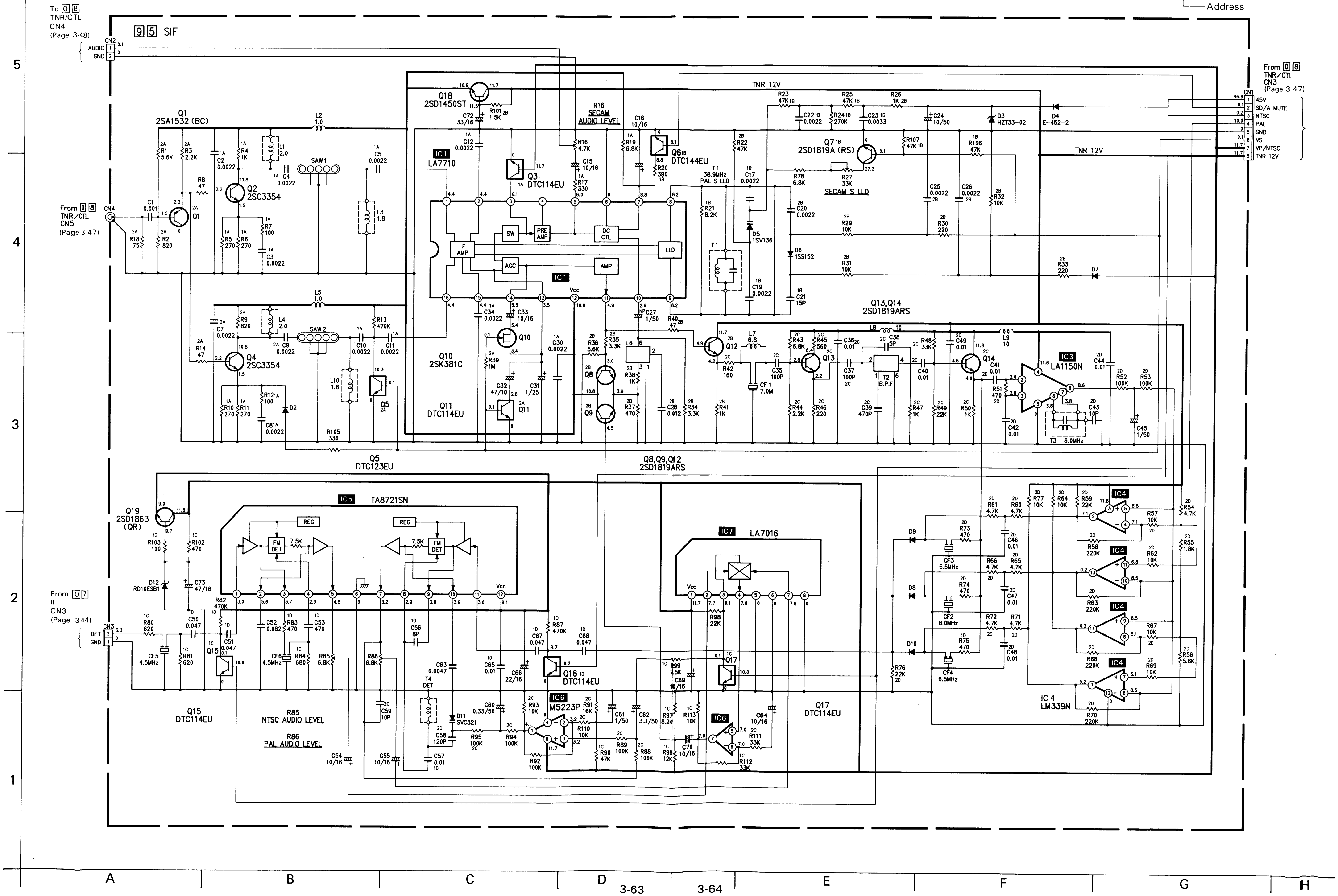
3.31 SERVO CIRCUIT BOARD



R420
SW POINT (NTSC)
R421
SW POINT (PAL)
CN402
R422
D406
D405
Q401
Q403
Q402
D404
D403
D412
D411
R425
R424
R423
R420
NT SW.P
R421
P/S SW.P
L501
C507
C502
C504
C505
R501
IC501
TP501
AVG.FM
C509
C508
C506
R511
R508
R503
R502
D408
D407
R434
B6
B7
B15
B16
IC401
PB2043
TP603
C427
C411
TH401
C413
C412
D.START (H)
LP ADJ
TP404
R419
R418
C408
C407
CN403
R435
TP GND
TP411
D.FF
C423
CN401
C422
TP401
CTL.P
C421
C420
R430
C418
C419
R439
R428
R429
C417
R427
C415
C416
C426
CN404
CP401
R414
C409
R417
C410
R415
R437
R436
R416
R413
R412
R411
R410
R440
D410
D409
R438
R409
R408
R407
R406
C405
C406
R405
R403
D402
D401
C404
C403
CN405
R426
C414
C401
C402
R401
R402
R404
CN406
CN407
SERVO PWB
4 8 PB20431
SERVO PWB ASS'Y
A
B
C
D
E
F
G
H
1
2
3
4
5

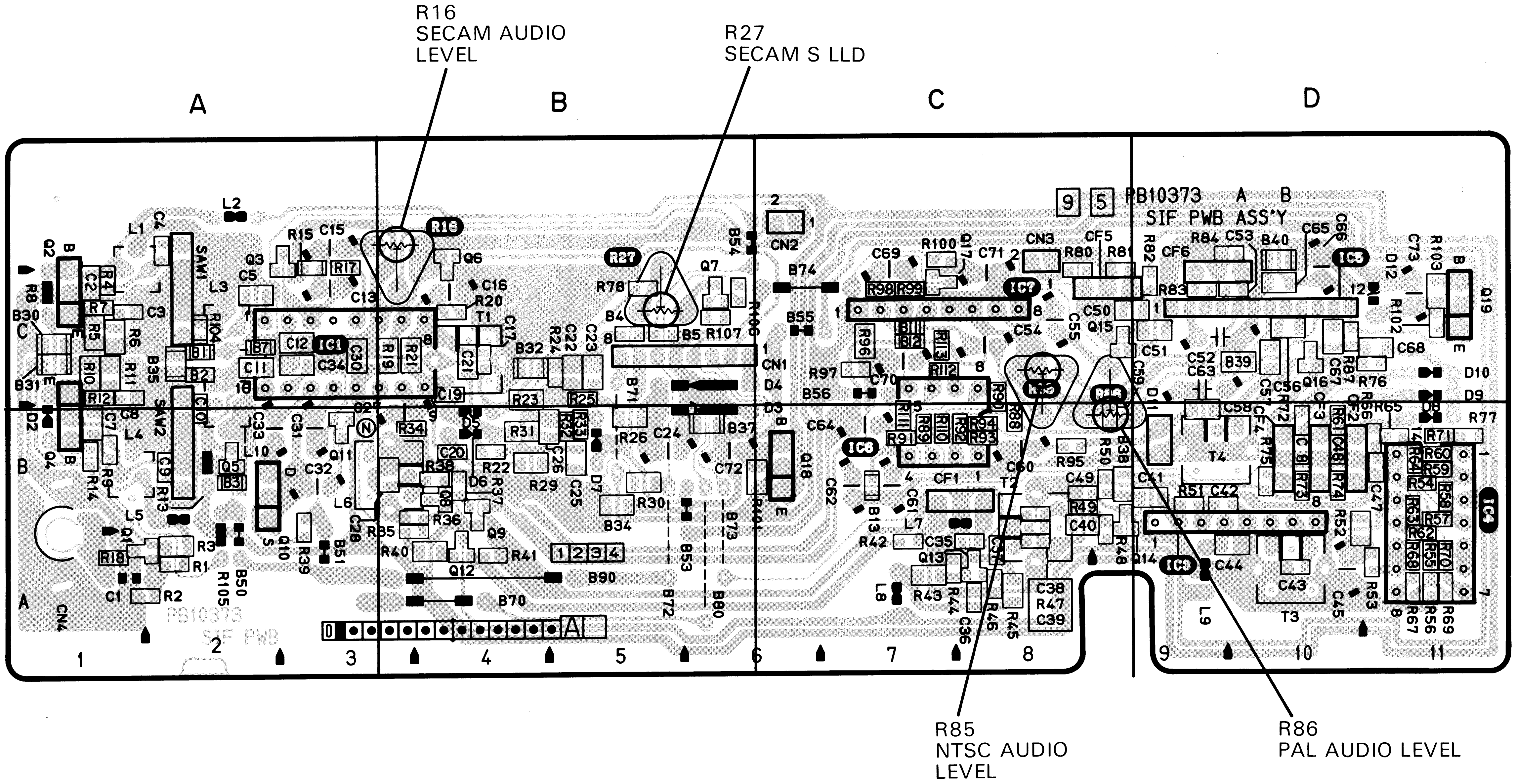
3.32 SIF SCHEMATIC DIAGRAM

• Address of chip parts
1D
Address



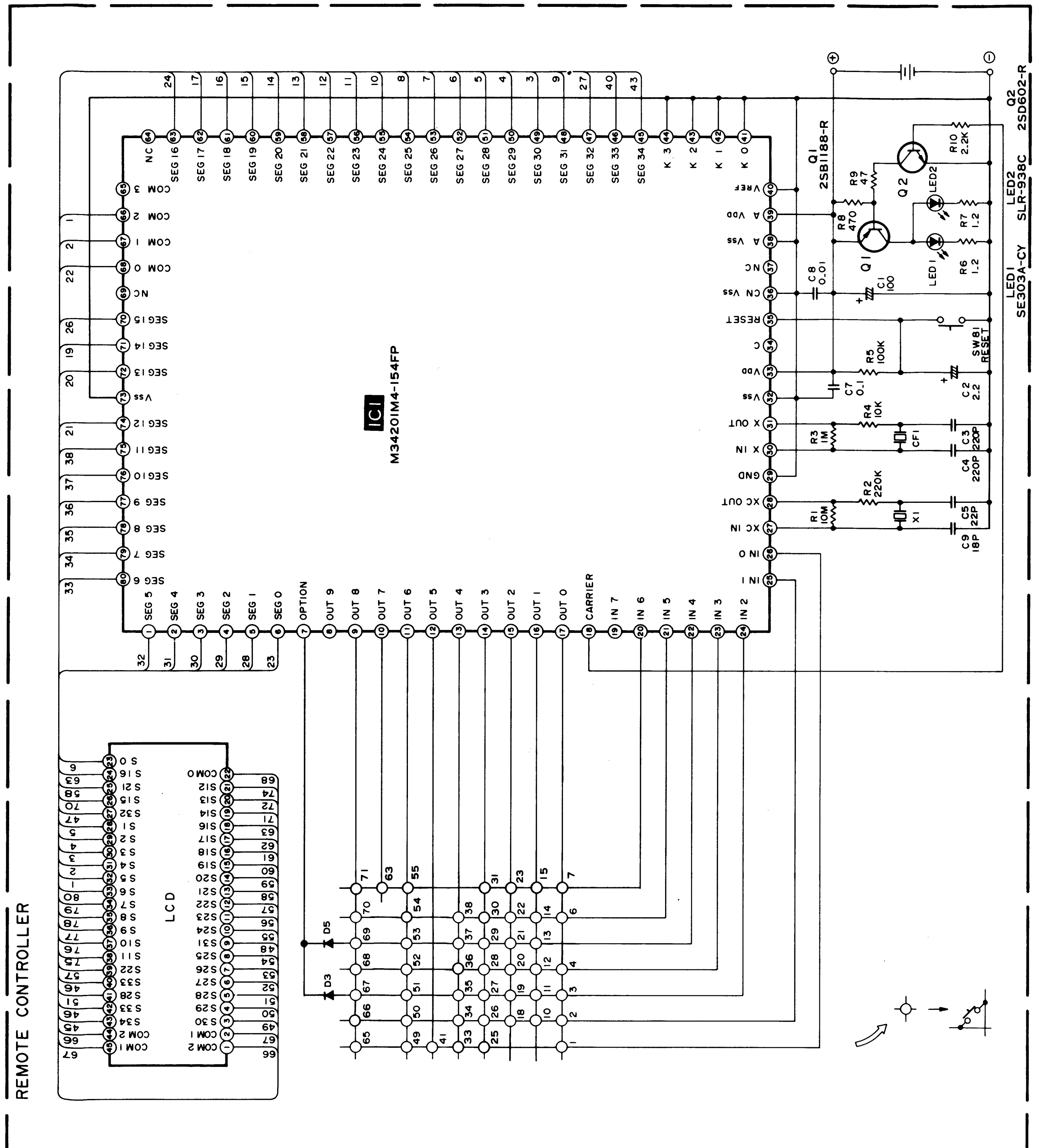
95 SIF
To 08 TNR/CTL CN4 (Page 3-48)
CN2
AUDIO
GND
From 08 TNR/CTL CN5 (Page 3-47)
CN4
From 08 TNR/CTL CN3 (Page 3-47)
CN1
45V
SD/A MUTE
NTSC
PAL
GND
VS
VP/NTSC
TNR 12V
From 07 IF CN3 (Page 3-44)
CN3
DET
GND
Q1 2SA1532 (BC)
Q2 2SC3354
Q4 2SC3354
Q5 DTC123EU
Q18 2SD1450ST
Q3 DTC114EU
Q6 DTC144EU
Q7 2SD1819A (RS)
Q10 2SK381C
Q11 DTC114EU
Q8,Q9,Q12 2SD1819ARS
Q13,Q14 2SD1819ARS
Q15 DTC114EU
Q16 DTC114EU
Q17 DTC114EU
Q19 2SD1863 (QR)
IC1 LA7710
IF AMP
SW
PRE AMP
DC CTL
AGC
AMP
LLD
IC3 LA1150N
IC4 LM339N
IC5 TA8721SN
REG
FM DET
7.5K
IC6 M5223P
IC7 LA7016
SAW1
SAW2
R16 SECAM AUDIO LEVEL
SECAM S LLD
T1 38.9MHz PAL S LLD
T2 B.P.F
T3 6.0MHz
T4 DET
CF1 7.0M
CF2 6.0MHz
CF3 5.5MHz
CF4 6.5MHz
CF5 4.5MHz
CF6 4.5MHz
D3 HZT33-02
D4 E-452-2
D5 1SV136
D6 1SS152
D11 SVC321
D12 RD10ESB1
TNR 12V
R85 NTSC AUDIO LEVEL
R86 PAL AUDIO LEVEL
1
2
3
4
5
A
B
C
D
E
F
G
H

3.33 SIF CIRCUIT BOARD


R16
SECAM AUDIO
LEVEL
R27
SECAM S LLD
R85
NTSC AUDIO
LEVEL
R86
PAL AUDIO LEVEL
A
B
C
D
1
2
9 5 PB10373 A B
SIF PWB ASS'Y
IC1
IC3
IC4
IC5
IC6
IC7
IC8
SAW1
SAW2
CN1
CN2
CN3
CN4
T1
T2
T3
T4
CF1
CF5
CF6
PB10373
SIF PWB

3.34 REMOTE CONTROL SCHEMATIC DIAGRAM

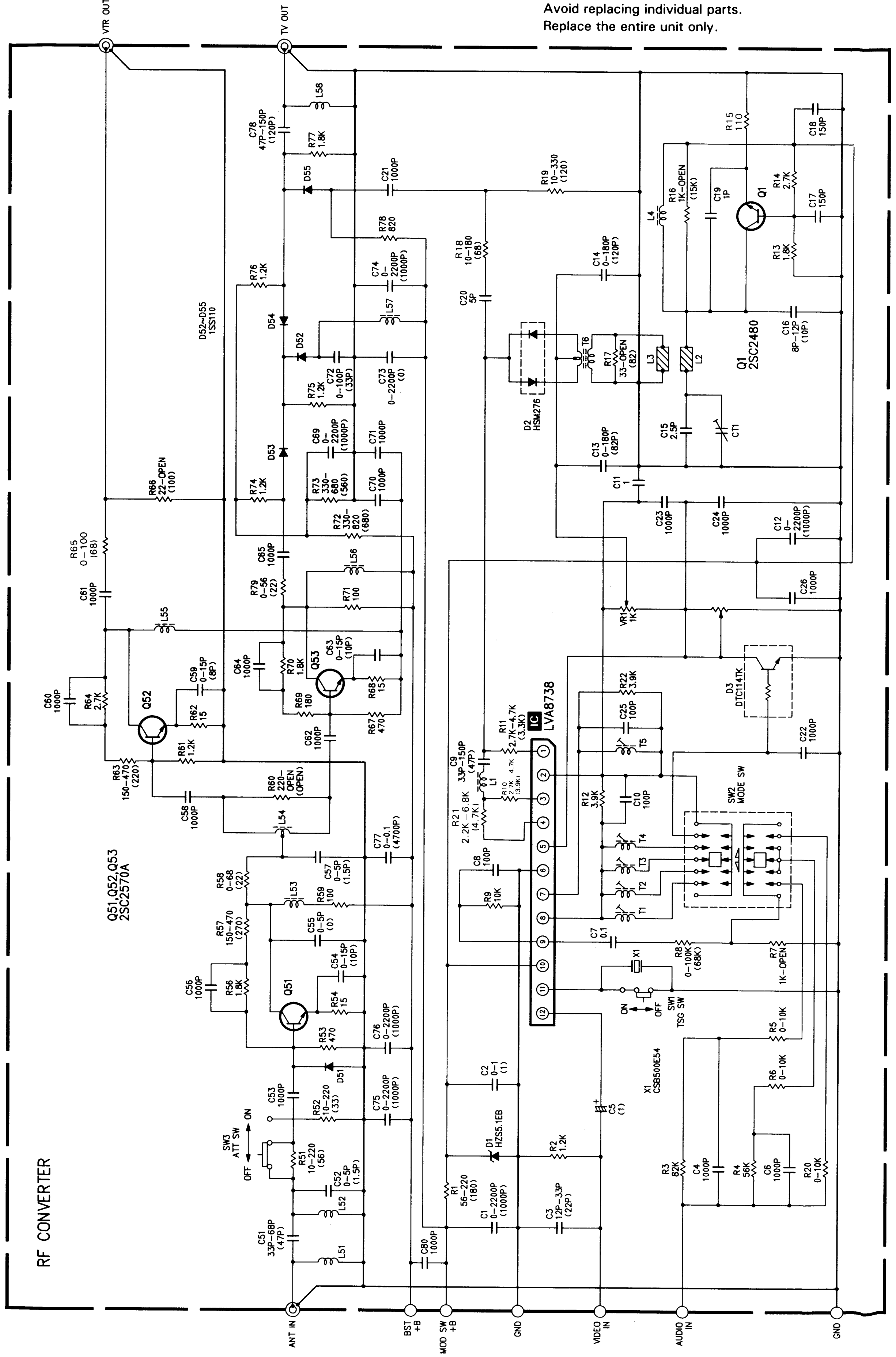
NOTES: 1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
Avoid replacing individual parts.
Replace the entrie unit only.


REMOTE CONTROLLER
IC1
M34201M4-154FP
LCD
Q1
2SB1188-R
Q2
2SD602-R
LED1
SE303A-CY
LED2
SLR-938C
SW81
RESET
X1
CF1
D3
D5
R1 10M
R2 220K
R3 1M
R4 10K
R5 100K
R6 1.2
R7 1.2
R8 470
R9 47
R10 2.2K
C1 100
C2 2.2
C3 220P
C4 220P
C5 22P
C7 0.1
C8 0.01
C9 18P

KEY NUMBER	FUNCTION
1	A/B CODE
2	CLOCK ADJ
3	1
4	6
6	MARK
7	EDIT MODE
10	MEMORY PROG
11	2
12	7
13	CH ∨ /CUSOR→
14	EDIT START
15	EDIT STANDBY
18	MEMORY CANCEL
19	3
21	CH ∧ /CURSOR→
22	INDEX/PAGE
23	ERASE
25	TRANS
26	PROGRAM/ACCESS
27	4
28	9
29	DISPLAY/ROTATE
30	GO-TO/TIMED PAGE
31	C. MEMORY
33	TIMER
34	CANCEL/RESET
35	5
36	0/AUX
37	VHS/CH/REVEAL
38	INTRO/PAGE(+)
41	TV/VTR
49	STOP/HOLD
50	EJECT
51	FF/BLUE
52	REW
53	REC
54	PLAY/OK/STORE
55	PAUSE/MIX
63	SKIP/BLANK/SEARCH
65	MONITOR TV/VIDEO
66	TV OPERATE
67	TV CH V
68	TV CH Λ
69	TV VOL +
70	TV VOL −
71	OPERATE

3.35 RF CONVERTER AND SWITCH SCHEMATIC DIAGRAM

NOTE: 1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.


RF CONVERTER
VTR OUT
TV OUT
ANT IN
BST +B
MOD SW +B
GND
VIDEO IN
AUDIO IN
GND
Q51,Q52,Q53
2SC2570A
D52~D55
1SS110
IC
LVA8738
Q1
2SC2480
D1
HZS5.1EB
D2
HSM276
D3
DTC114TK
X1
CSB500E54
SW1
TSG SW
SW2
MODE SW
SW3
ATT SW
OFF
ON

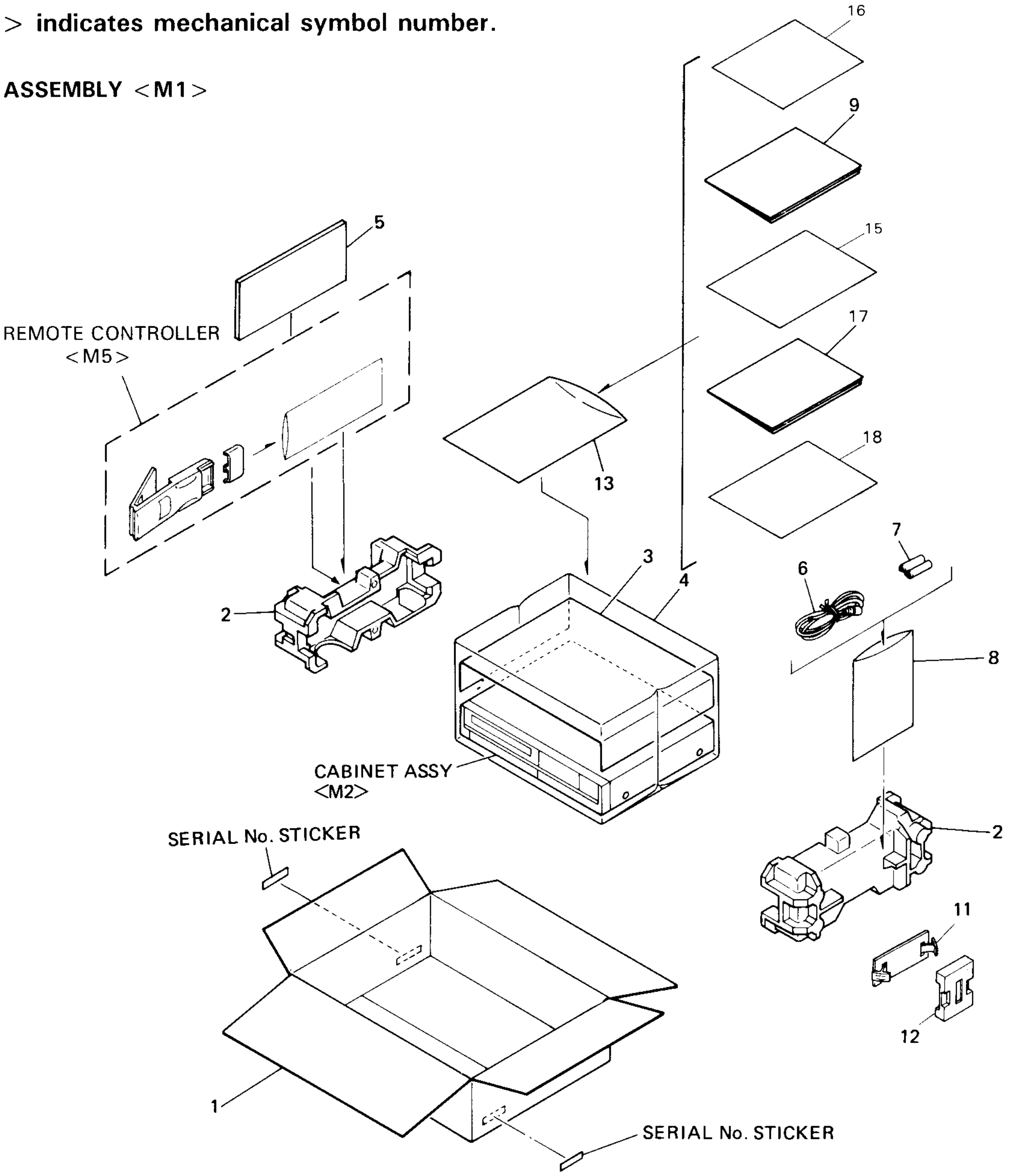
SECTION 4
EXPLODED VIEWS AND PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

NOTE: <M > indicates mechanical symbol number.

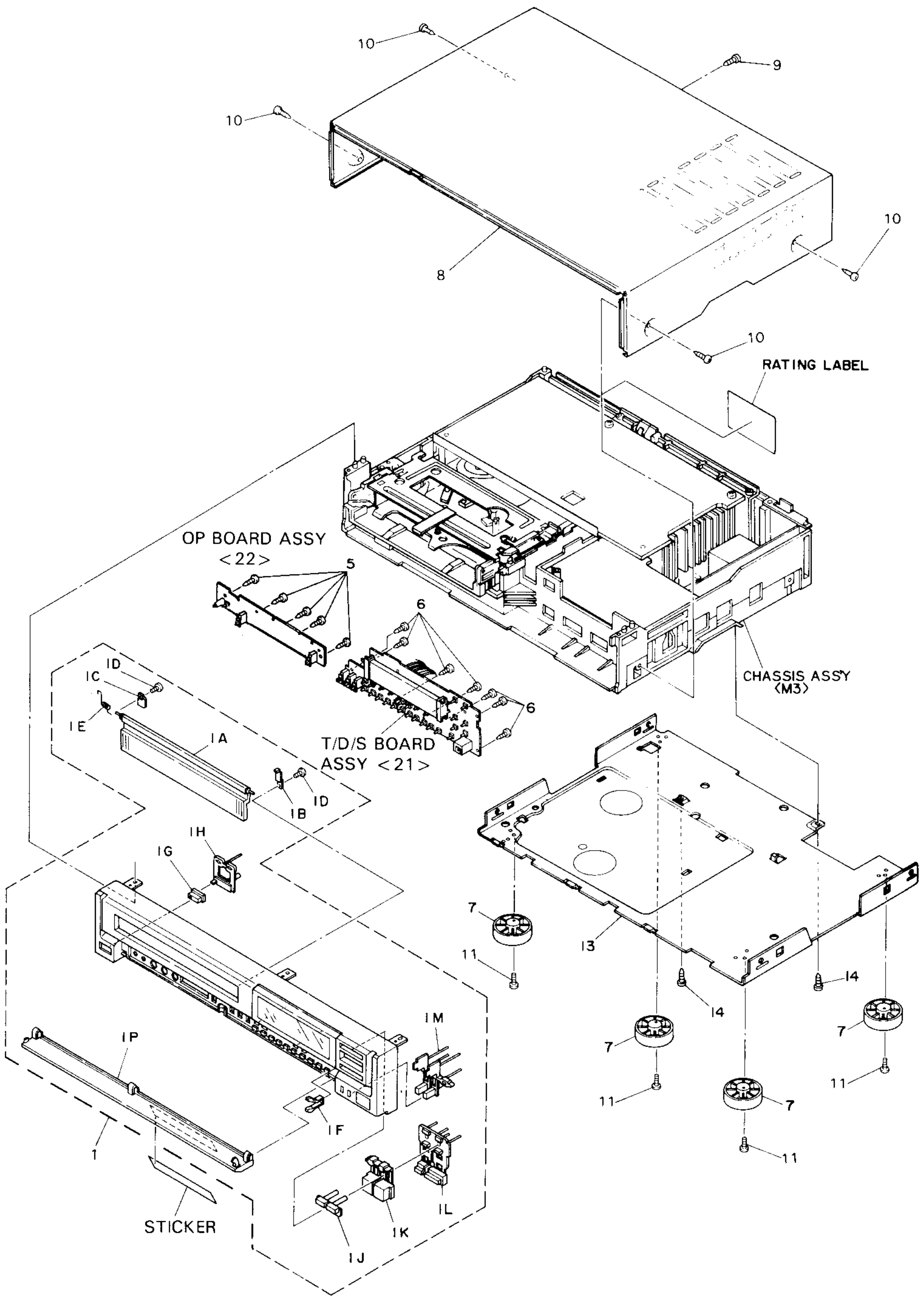
4.1 PACKING ASSEMBLY <M1>


16
9
5
15
17
REMOTE CONTROLLER
<M5>
18
13
7
3
4
6
2
8
CABINET ASSY
<M2>
SERIAL No. STICKER
2
11
12
1
SERIAL No. STICKER

PACKING ASSEMBLY <M1>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	1	PQ33099-5-3	PACKING CASE
	2	PQ33104A	CUSHION ASSY
	3	PQ41026-20	PROTECT SHEET
	4	PQM30021-59-11	POLY BAG
	5	PQ42987-6	SHEET
	6	PU59168-3	RF CABLE
	or	PU59167-3	RF CABLE
	7	UM-3DJ2P	BATTERY, X2
	8	QPGA020-02005	POLY BAG
⚠	9	PU30425-1154	INSTRUCTIONS(1)
	11	PQ31424A	HANDLE ASS'Y
	12	PQ33297	CUSHION
	13	QPGA025-03505	POLY BAG
	15	TCU-3492	TAPE CATALOG
	16	TCN-3379	TAPE CATALOG
⚠	17	PU30425-1173	INSTRUCTIONS(2)
	18	PU60980-2	SHEET(PLUG)

4.2 CABINET ASSEMBLY <M2>


10
9
10
10
8
10
RATING LABEL
OP BOARD ASSY
<22>
5
6
CHASSIS ASSY
<M3>
ID
IC
IE
IA
T/D/S BOARD
ASSY <21>
6
IB
ID
IH
IG
7
13
11
14
14
7
7
IM
IP
11
11
7
IF
1
11
IL
IK
STICKER
IJ

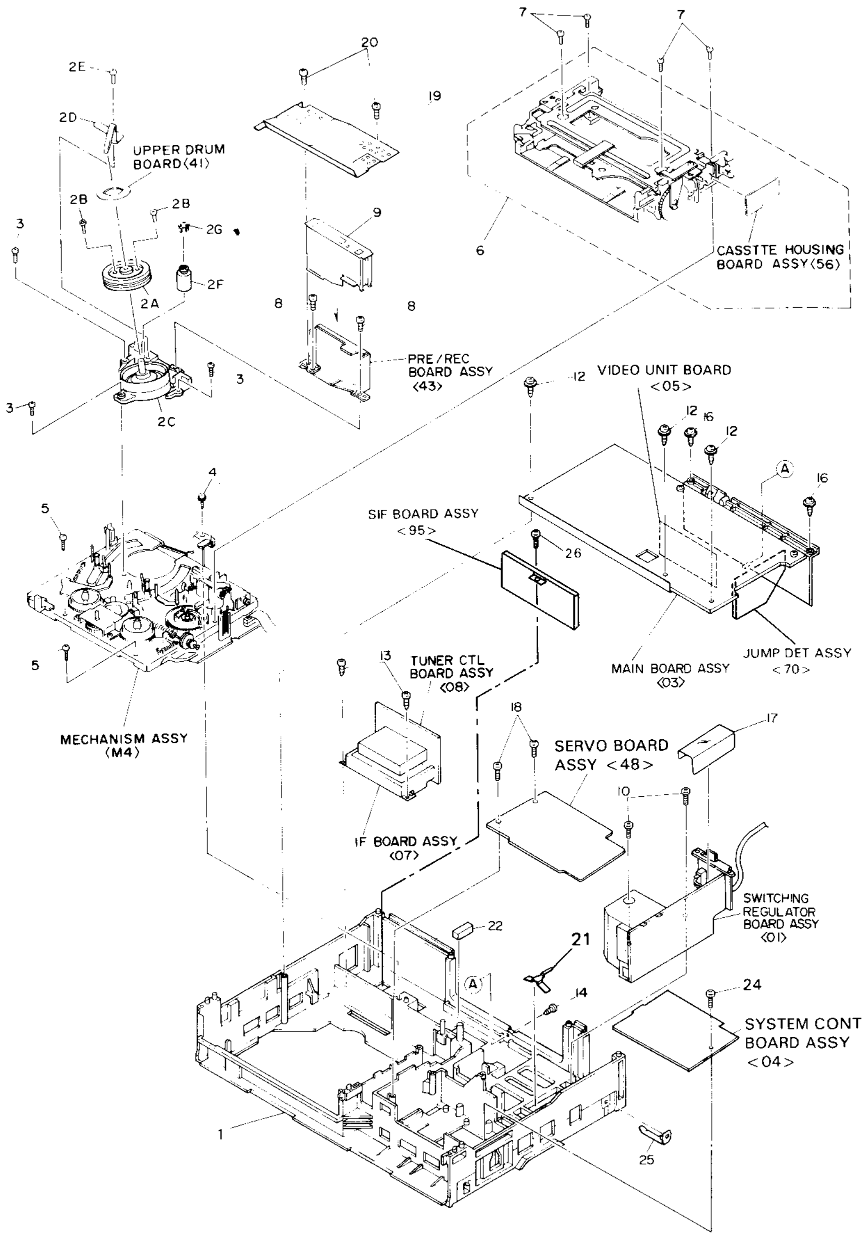
****

CABINET ASSEMBLY <M2>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	1	PQ10837J-10	FRONT PANEL ASSY
	1A	PQ20811-8-2	CASSETTE HOUSING DOOR
	1B	PQ43371	BRACKET 1
	1C	PQ43736	BRACKET(4)
	1D	SDSF2006Z	SCREW, X2
	1E	PQ43628-1-1	TORSION SPRING
	1F	PU60005	PUSH OPEN UNIT
	1G	PQ32617-8	BUTTON(POWER)
	1H	PQ43730	INDICATOR(POWER)
	1J	PQ32842-3	BUTTON(FF)
	1K	PQ32843-3	BUTTON(PLAY)
	1L	PQ20813-5	BUTTON(PAUSE)
	1M	PQ32844-2	BUTTON(CH)
	1P	PQ32845J-5	DOOR ASSY
	5	SDSF2608Z	SCREW, X5
	6	SDSF2608Z	SCREW, X7
	7	PQ43456C	FOOT ASS'Y, X4
⚠	8	PQ10602-15	TOP COVER
	9	SDSF3010M	SCREW, FOR TOP COVER
	10	PQ43827	SPECIAL SCREW,X4 FOR TOP COVER
	11	SDSF3012Z	SCREW, X4 FOR FOOT
⚠	13	PQ10712-1-3	BOTTOM COVER
	14	SDSF3012Z	SCREW, X2, FOR BOTTOM COVER

4.3 CHASSIS ASSEMBLY <M3>

BEWARE OF BOGUS PARTS
Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.



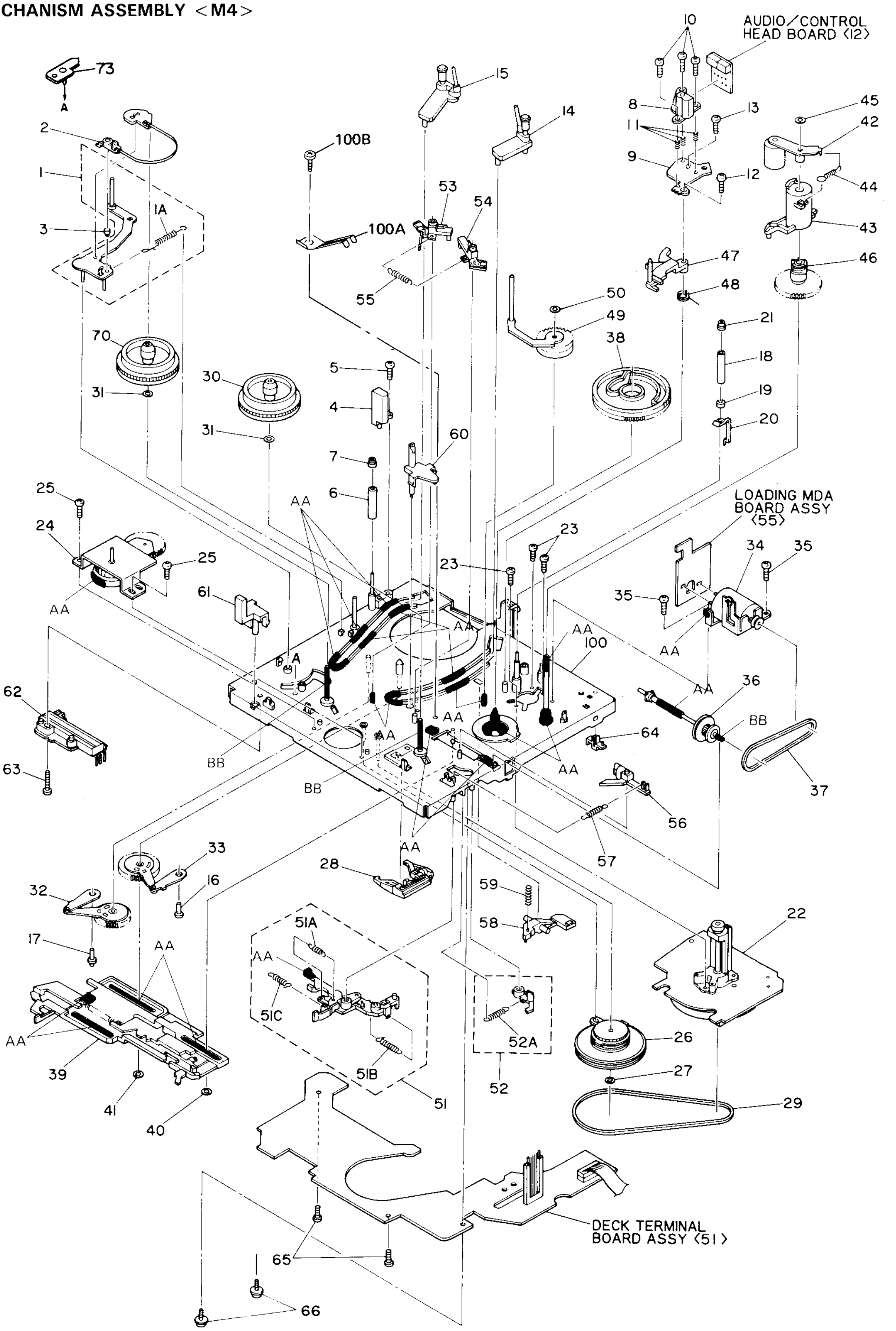
2E
2D
UPPER DRUM BOARD<41>
2B
2B
2G
2F
2A
3
3
3
3
2C
20
19
9
8
8
PRE/REC BOARD ASSY <43>
7
7
6
CASSTTE HOUSING BOARD ASSY<56>
12
VIDEO UNIT BOARD <05>
12
16
12
A
16
4
5
5
SIF BOARD ASSY <95>
26
MECHANISM ASSY (M4)
13
TUNER CTL BOARD ASSY <08>
MAIN BOARD ASSY <03>
JUMP DET ASSY <70>
18
SERVO BOARD ASSY <48>
17
10
IF BOARD ASSY <07>
SWITCHING REGULATOR BOARD ASSY <01>
22
21
A
14
24
SYSTEM CONTROL BOARD ASSY <04>
1
25

* *

CHASSIS ASSEMBLY <M3>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
⚠	1	PQ10764-1-6	BOTTOM CHASSIS
	2A	PDM2002D	UPPER DRUM ASSY
	2B	PDM4165A	DRUM SCREW ASSY, X2
	2C	PDM2108K	LOWER DRUM MOTOR ASSY
	2D	PDM4181A-5	BRUSH ASSY
	2E	SPSG2606Z	SCREW, FOR BRUSH ASSY
	2F	PDM4187A	I.D.ROLLER ASSY
	2G	PQ41163	CAP
	3	SPST2610Z	SCREW, X3, FOR DRUM
	4	PQ43831	SPECIAL SCREW, FOR MAIN DECK
	5	PQ43831	SPECIAL SCREW,X2,FOR MAIN DECK
	6	PUS29183B-7	CASSETTE HOUSING ASSY
	7	SDST2608Z	SCREW, X4, FOR C.HOUSING
	8	SDSG2606Z	SCREW, X2, FOR PRE/REC
	9	PQ32217-1-1	SHIELD CASE(2), FOR PRE/REC
	10	PQ43831	SPECIAL SCREW, X2, FOR POWER TRANS
	12	GPSF2610Z	SCREW, X3, FOR MAIN BOARD
	13	SDSF3008Z	SCREW, X2, FOR TUNER UNIT
	14	SDSF3010M	SCREW, FOR TERMINAL BOARD
	16	GPSF2610Z	SCREW, X2, FOR TERMINAL BOARD
⚠	17	PQ44631	AC COVER
	18	SDSF2610Z	SCREW, X2, FOR SERVO
	19	PQ32387-1-4	DRUM SHIELD
	20	SDST2608Z	SCREW, X2, FOR D.SHIELD
	21	PQ43942	EARTH PLATE
	22	PQM30029-127	SPACER, CHASSIS
	24	SDSF2610Z	SCREW, FOR MECHA CON
	25	PQ44679	EARTH PLATE
	26	SDSF2610Z	SCREW, FOR SIF BOARD

4.4 MECHANISM ASSEMBLY <M4>


73
A
2
1
3
1A
70
31
30
31
15
100B
100A
53
54
55
14
10
AUDIO/CONTROL HEAD BOARD <I2>
8
13
11
9
12
45
42
44
43
46
47
48
50
49
38
21
18
19
20
5
4
7
6
60
AA
25
24
25
AA
23
23
LOADING MDA BOARD ASSY <55>
34
35
35
AA
61
A
AA
100
AA
62
63
BB
BB
AA
36
BB
37
64
AA
56
57
AA
33
16
32
17
28
59
58
22
AA
51A
AA
51C
51B
51
52A
52
26
27
29
AA
39
41
40
DECK TERMINAL BOARD ASSY <51>
65
66

Category	Part number	MARK
Grease	KANTO-G-31KAV	AA
Oil	COSMO-HV56	BB

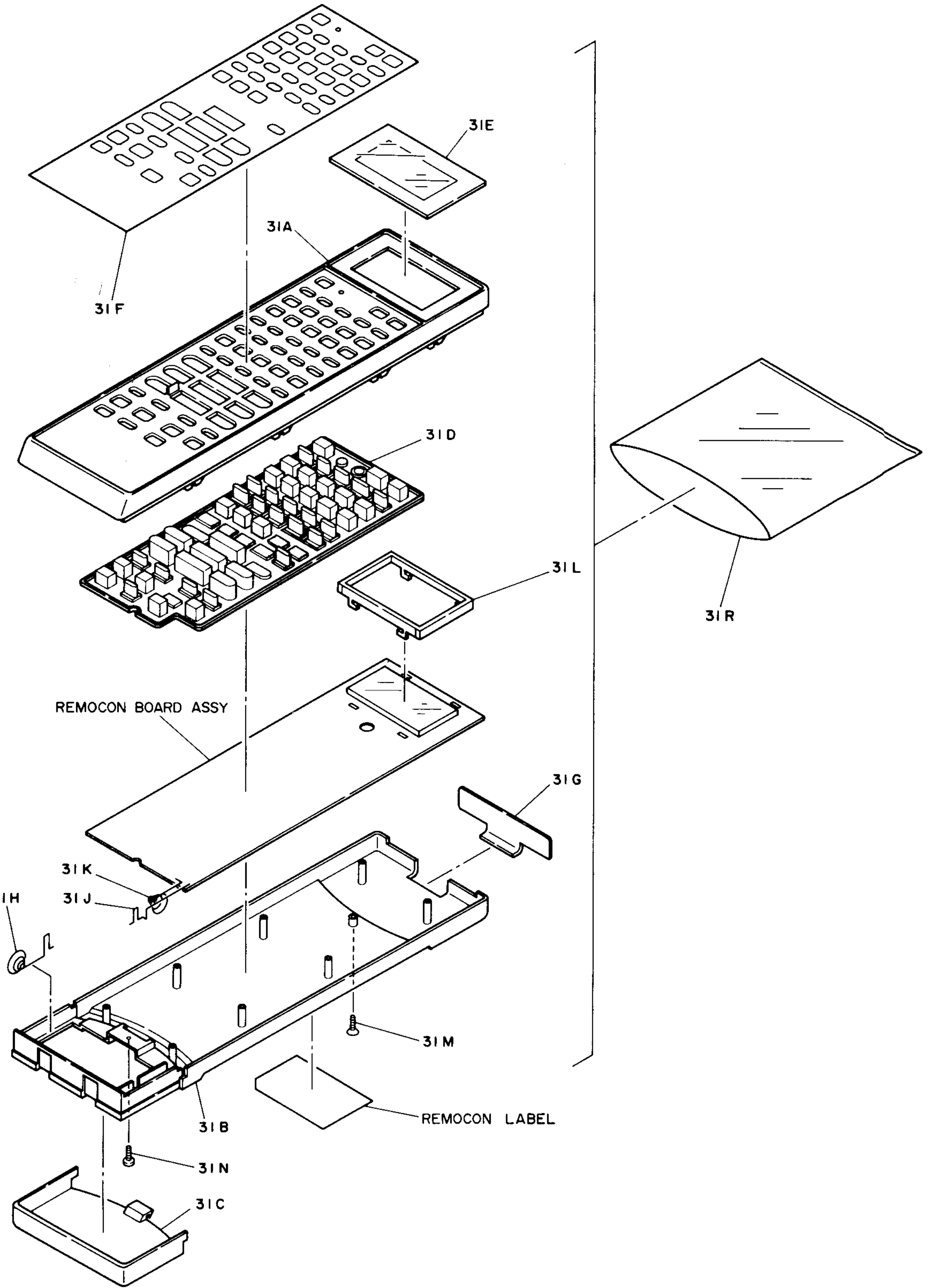
NOTE: The section marked in AA and BB indicate lubrication and greasing areas.

* *

MECHANISM ASSEMBLY <M4>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	1	PQ43497E-8	TENSION ARM ASSY
	1A	PQ43500	TENSION SPRING
	2	PQ43501B	TENSION BAND ASSY
	3	PQ43503-1-4	ADJUST PIN
	4	PU60616	FULL ERASE HEAD
	5	SDSF2614Z	TAPPING SCREW
	6	PQ43505-1-1	ROLLER
	7	PQ43506	GUIDE POLE CAP
	8	PU60617	AUDIO/CONTROL HEAD
	9	PQ43509	HEAD BASE
	10	PQ43687A	SCREW,X3
	11	PQM30002-192	COMPRESSION SPRING,X3
	12	SPSP2606Z	SCREW
	13	SPSF2608M	TAPPING SCREW
	14	PU61103-2	POLE BASE ASSY(TAKE-UP)
	15	PU61151-2	POLE BASE ASSY(SUPPLY)
	16	PQ43524	STOPPER
	17	PQ43525	STOPPER 2
	18	PQ43526-1-3	TAPE GUIDE
	19	PQ43670-1-1	GUIDE FLANGE
	20	PQ43675	TAPE GUARD
	21	PQ43506	GUIDE POLE CAP
⚠	22	PU60892	CAPSTAN MOTOR
	23	SPSG2608Z	TAPPING SCREW,X3
	24	PU60618-1-3	IDLER GEAR UNIT
	25	SPST2606Z	SCREW,X2
	26	PU60953-1-2	CLUTCH UNIT
	27	PQM30017-8	SLIT WASHER
	28	PQ43532A-1	CHANGE LEVER ASSY
	29	PQM30003-24	BELT
	30	PU60858	REEL DISK(TAKE-UP)
	31	PQM30018-54	SPACER,X2
	32	PQ43537A	LOADING ARM ASSY(SUPPLY)
	33	PQ43542B	LOADING ARM ASSY(TAKE-UP)
	34	PQ43676B-5	MODE MOTOR ASSY
		or PQ43676C	MODE MOTOR ASSY
	35	SPST2606Z	TAPPING SCREW,X2
	36	PQ43548A-2	WORM CLUTCH ASSY
	37	PQM30003-23	BELT(LOADING)
	38	PQ32413-1-6	CONTROL CAM
	39	PQ43555B-6	PLATE ASSY
	40	PQM30017-12	SLIT WASHER
	41	PQM30017-8	SLIT WASHER
	42	PQ43558A	PINCH ROLLER ARM ASSY
		or PQ43558B	PINCH ROLLER ARM ASSY
	43	PQ32415	PINCH ROLLER PRESS LEVER
	44	PQM30001-233	TENSION SPRING
	45	PQM30017-12	SLIT WASHER
	46	PQ32416-2	PINCH ROLLER CAM
	47	PQ43567A-8	GUIDE ARM ASSY
	48	PQ43569-1-3	TORSION SPRING
	49	PQ43570A	HALF LOADING GEAR ASSY
	50	PQM30017-12	SLIT WASHER
	51	PQ43575A-5	CANCEL LEVER ASSY
	51A	PQM30001-273	TENSION SPRING
	51B	PQM30001-237	TENSION SPRING
	51C	PQM30001-274	TENSION SPRING
	52	PQ43578A-2	HOOK ASSY
	52A	PQM30001-238	TENSION SPRING
	53	PQ43581A-6	MAIN BRAKE ASSY(SUPPLY)
	54	PQ43582A-2	MAIN BRAKE ASSY(TAKE-UP)
	55	PQM30001-251	TENSION SPRING
	56	PQ43583A	SUB BRAKE ASSY(TAKE-UP)
	57	PQM30001-235	TENSION SPRING
	58	PQ43584A-4	CAPSTAN BRAKE ASSY
	59	PQM30002-201	COMPRESSION SPRING
	60	PU60621-1-2	LED HOLDER(INCL.LED:D1)
	61	PU60624-1-4	REC SAFETY SWITCH(S2)
	62	PU60622-1-1	SLIDE SWITCH(S3)
	63	SDSF2614Z	TAPPING SCREW
	64	PQ32516	PWB HOLDER
	65	SDST2616Z	TAPPING SCREW,X2
	66	GPSF2608Z	TAPPING SCREW,X2
	70	PU60859	REEL DISK (SUPPLY)
	73	PQ44246	TENSION BAND BRACKET-2
	100	PQ20650D-18	MAIN DECK ASSY
	100A	PQ43849	EARTH PLATE
	100B	SPST2604Z	SCREW

4.5 REMOTE CONTROL ASSEMBLY <M5>


31E
31A
31F
31D
31L
31R
REMOCON BOARD ASSY
31G
31K
31H
31J
31M
REMOCON LABEL
31B
31N
31C

✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱

5. REMOTE CONTROL UNIT ⟨M5⟩

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION
⚠	31	PQ10884K-7	REMOTE CONTROLLER
	31A	PQ20861	COVER (FRONT)
	31B	PQ20862	COVER (REAR)
	31C	PQ32956	CAP (BATTERY)
	31D	PQ20863-8	BUTTON
	31E	PQ44010	PLATE (1)
	31F	PQ32922-9-7	PLATE (2)
	31G	PQ32957	WINDOW (IR)
	31H	PQ44008	TERMINAL (A)
	31J	PQ44023	TERMINAL (B)
	31K	PQ44024	TERMINAL (C)
	31L	PQ44009	LCD HOLDER
	31M	SSSF2010M	SCREW
	31N	SPSJ2006M	SCREW
	31R	QPGA012-03005	POLY BAG

SECTION 5
ELECTRICAL PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

* *

POWER TRANSFORMER BOARD ASSEMBLY <01>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	PWBA	PB20439K-01	P.TRANSFORMER BOARD ASSY
⚠	POC1	QMP3980-200	POWER CORD
⚠	BKT1	PQ20971	TRANS BRACKET
⚠	HD1	QHS3771-108	STRAIN RELIEF
	SCW1	SDST3006Z	SCREW,X4
	SLD1	PQ33261-1-1	SHIELD CASE (1)
	SLD2	PQ33262	SHIELD CASE (2)

—SWITCH REGULATOR BOARD ASSEMBLY <01>—

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA1	PB20439K1-01	SWITCHING REG. BOARD ASSY	
	IC1	LM358N	IC	
		or LM358P	IC	
		or BA10358	IC	
	Q1	2SC4304-LF619	TRANSISTOR	
	Q2	2SC3616(MLK)	TRANSISTOR	
	Q3	2SC1740S	TRANSISTOR	
	Q4	2SC1741S	TRANSISTOR	
	Q5	2SB941P	TRANSISTOR	
	D1	10E6-F2	DIODE	
	D2	10E6-F2	DIODE	
	D3	10E6-F2	DIODE	
	D4	10E6-F2	DIODE	
	D5	AU01	FR DIODE	
	D6	AU01	FR DIODE	
	D7	MTZ27BT-77	ZENER DIODE	
	D8	AU01Z	FR DIODE	
		or ERA48-02-T	FR DIODE	
	D9	RD13ES-T1B3	DIODE	
		or UZ13BSC	ZENER DIODE	
	D10	1SS133	DIODE	
		or MA165	DIODE	
	D11	RD18ES-T1B1	ZENER DIODE	
		or UZ18BSA	ZENER DIODE	
	D12	AU01Z	FR DIODE	
		or ERA48-02-T	FR DIODE	
	D14	AU01Z	FR DIODE	
		or ERA48-02-T	FR DIODE	
	D15	AU01Z	FR DIODE	
		or ERA48-02-T	FR DIODE	
	D16	FML-12S	FR DIODE	
		or F6P20F	FR DIODE	
	D17	FMB-24	BARRIER DIODE	
		or F5KQ40B	BARRIER DIODE	
	D18	AU01Z	FR DIODE	
		or ERA48-02-T	FR DIODE	
	D19	MTZ30AT-77	ZENER DIODE	
	D20	RD8.2ES-T1B1	ZENER DIODE	
		or UZ8.2BSA	ZENER DIODE	
	D21	AK04	DIODE	
	D22	MTZV6.2A	ZENER DIODE	
	D30	UZ33BSD	ZENER DIODE	
		or RD33ES-T1B4	ZENER DIODE	
		or MTZ33DT-77	ZENER DIODE	
	R1	QRZ0078-2R2	W.W.RESISTOR	2.2Ω,2W
	R2	QRD161J-184	RESISTOR	180kΩ,1/6W
	R3	QRD161J-184	RESISTOR	180kΩ,1/6W
	R4	QRD161J-563	RESISTOR	56kΩ,1/6W
	R5	QRG029J-683G	OMF RESISTOR	68kΩ,2W
	R6	QRG029J-241G	OMF RESISTOR	240Ω,2W
	R7	QRD161J-122	RESISTOR	1.2kΩ,1/6W
	R8	QRD161J-471	RESISTOR	470Ω,1/6W
	R9	QRX014J-R33	MF RESISTOR	0.33Ω,2W
	R10	QRG029J-303A	OMF RESISTOR	30kΩ,2W
	R11	QRD161J-223	RESISTOR	22kΩ,1/6W
	R12	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R14	QRG029J-560G	RESISTOR	56Ω,2W
	R15	QRD161J-334	RESISTOR	330kΩ,1/6W
	R16	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R17	QRD161J-221	RESISTOR	220Ω,1/6W
	R18	QRD161J-102	RESISTOR	1kΩ,1/6W
	R19	QRV144F-1051AY	CMF RESISTOR	1.05kΩ,1/4W
	R20	QRV144F-1001AY	CMF RESISTOR	1kΩ,1/4W
⚠	R21	QRZ0077-470X	FUSIBLE RESISTOR	47Ω,1/4W
	R22	QRD161J-333	RESISTOR	33kΩ,1/6W
	R23	QRD161J-471	RESISTOR	470Ω,1/6W
	R24	QRV144F-4023AY	RESISTOR	
	R25	QRV144F-1002AY	CMF RESISTOR	10kΩ,1/4W
	R26	QRV144F-1182AY	CMF RESISTOR	11.8kΩ,1/4W
	R28	QRD161J-331	RESISTOR	330Ω,1/6W
	R29	QRD161J-103	RESISTOR	10kΩ,1/6W
	R53	QRD161J-222	RESISTOR	2.2kΩ,1/6W
⚠	C1	QFZ9022-333	MM CAPACITOR	0.033μF,400V
⚠	C2	QFZ9022-333	MM CAPACITOR	0.033μF,400V
⚠	C3	QFZ9022-333	MM CAPACITOR	0.033μF,400V
⚠	C6	QCZ9016-222M	CAPACITOR	0.0022μF,400V
⚠	C7	QCZ9016-222M	CAPACITOR	0.0022μF,400V
⚠	C8	QCZ9016-222M	CAPACITOR	0.0022μF,400V
⚠	C9	QCZ9016-222M	CAPACITOR	0.0022μF,400V
⚠	C10	QCZ9016-222M	CAPACITOR	0.0022μF,400V
⚠	C11	QCZ9016-222M	CAPACITOR	0.0022μF,400V
	C12	QEZ0147-107	E CAPACITOR	100μF,400V
		or QEZ0111-107	E CAPACITOR	100μF,400V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C13	QCY53AK-472	CAPACITOR	0.0047µF,1KV
		or QCZ0212-472	CAPACITOR	0.0047µF
	C14	QCZ0212-101	CAPACITOR	100pF
	C15	QFV41HJ-474	TF CAPACITOR	0.47µF,50V
		or QFV11HJ-474	TF CAPACITOR	0.47µF,50V
	C16	QFL41HJ-682	M CAPACITOR	0.0068µF,50V
	C17	QETC1HM-105	E CAPACITOR	1µF,50V
	C18	QETC1JM-336	E CAPACITOR	33µF,63V
	C19	QEZ0125-277	E CAPACITOR	270µF,25V
		or QEZ0138-277	E CAPACITOR	270µF,25V
	C20	QETC1EM-107	E CAPACITOR	100µF,25V
	C21	QEMB1CM-158	E CAPACITOR	1500µF,16V
	C22	QETB1CM-108	E CAPACITOR	1000µF,16V
	C23	QFL41HJ-102	M CAPACITOR	0.001µF,50V
	C24	QEZ0136-228	E CAPACITOR	2200µF,10V
		or QEZ0106-228	E CAPACITOR	2200µF,10V
	C25	QETC1HM-476	E CAPACITOR	47µF,50V
	C26	QETC1VM-336	E CAPACITOR	33µF,35V
	C27	QFL41HJ-103	CAPACITOR	0.01µF,50V
	C28	QEZ0156-127Z	E CAPACITOR	120µF
		or QEZ0135-127Z	E CAPACITOR	120µF
	C29	QETC0JM-107	E CAPACITOR	100µF,6.3V
	C30	QFL41HJ-103	CAPACITOR	0.01µF,50V
	C50	QCBB1HJ-271	CAPACITOR	270pF,50V
⚠	C52	QCZ9016-101K	CAPACITOR	100pF,400V
⚠	C53	QCZ9016-101K	CAPACITOR	100pF,400V
	C54	QFL41HJ-471	M CAPACITOR	470pF,50V
	C55	QFV11HJ-124	MMT CAPACITOR	0.12µF,50V
	L1	PU60943-330K	COIL	33µH
	L2	PU60943-100M	COIL	10µH
	L3	PU60943-330K	COIL	33µH
	L4	PU48530-100K	COIL	10µH
⚠	PHS1	PC111S	PHOTO COUPLER	
⚠	T1	PELN0301	SW TRANS	
⚠	HD1	PU57505	FUSE CLI,X2	
⚠	HS1	PQ44724	HEAT SINK	
⚠	HS2	PQ44610-1-1	HEAT SINK, FOR Q1	
⚠	LF1	PU61108	LINE FILTER	
⚠		or PU60347	LINE FILTER	
⚠	LF2	PU59707	LINE FILTER	
⚠		or PELN0255	LINE FILTER	
	SCW1	SDSG3008Z	SCREW	
⚠	SCW2	SDSG3006Z	SCREW	
	SCW3	SDSG3008Z	SCREW,X2	
	SCW4	SDSG3006Z	SCREW	
⚠	SLD1	PQ44698	INSULATOR	
	SPC1	PU57215-2	SPACER	
⚠	TAB1	A74316	TAB,X2	

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	CN1	PU58844-104	CAP HOUSING
	CN2	PU58844-7	CAP HOUSING
⚠	CP1	ICP-N5	C PROTECTER
⚠	CP2	ICP-N20	CIRCUIT PROTECTOR
⚠	F1	QMF51E2-1R0	FUSE
⚠		or QMF51E2-1R0J1	FUSE

—REGULATOR BOARD ASSEMBLY <02>—

REF. No.	PART No.	PART NAME, DESCRIPTION	
PWBA2	PB20439K2-01	REGULATOR BOARD ASSY	
Q7	2SB1425(EU)	TRANSISTOR	
Q8	2SC1740S	TRANSISTOR	
Q9	2SB941P	TRANSISTOR	
Q10	2SC1740S(Q)	TRANSISTOR	
Q11	2SC1740S	TRANSISTOR	
Q12	2SA933S	TRANSISTOR	
	or 2SA1267(YG)-TJK	TRANSISTOR	
Q14	2SA1515S(PQR)	TRANSISTOR	
Q15	2SA1515S(PQR)	TRANSISTOR	
Q16	2SC3377(QR)	TRANSISTOR	
Q17	2SC3377(QR)	TRANSISTOR	
D24	11ES2	DIODE	
	or ERA15-02	DIODE	
D25	1SS133	DIODE	
	or MA165	DIODE	
D26	UZ5.1BSC	ZENER DIODE	
	or RD5.1ES-T1B3	ZENER DIODE	
	or MTZV5.1C	ZENER DIODE	
R31	QRD161J-102	RESISTOR	1kΩ,1/6W
R32	QRD161J-103	RESISTOR	10kΩ,1/6W
R33	QRD161J-221	RESISTOR	220Ω,1/6W
R34	QRD161J-822	RESISTOR	8.2kΩ,1/6W
R35	QRD161J-471	RESISTOR	470Ω,1/6W
R36	QRD161J-103	RESISTOR	10kΩ,1/6W
R37	QVZ3518-471AZ	V RESISTOR,SWD 5V	
	or QVZ3523-471AZ	V RESISTOR,SWD 5V	
R38	QRD161J-472	RESISTOR	4.7kΩ,1/6W
R39	QRD161J-102	RESISTOR	1kΩ,1/6W
R40	QRD161J-103	RESISTOR	10kΩ,1/6W
⚠ R41	QRZ0077-220X	FUSIBLE RESISTOR	22Ω,1/4W
R42	QRD161J-222	RESISTOR	2.2kΩ,1/6W
R43	QRD161J-222	RESISTOR	2.2kΩ,1/6W
R44	QRD161J-821	RESISTOR	820Ω,1/6W
R45	QRD161J-821	RESISTOR	820Ω,1/6W
R46	QRD161J-222	RESISTOR	2.2kΩ,1/6W
R47	QRD161J-222	RESISTOR	2.2kΩ,1/6W
R48	QRD161J-101	RESISTOR	100Ω,1/6W
R49	QRD161J-101	RESISTOR	100Ω,1/6W
R51	QRD161J-102	RESISTOR	1kΩ,1/6W
R52	QRD161J-222	RESISTOR	2.2kΩ,1/6W
C34	QETC1JM-226	E CAPACITOR	22µF,63V
C35	QETC1CM-107	E CAPACITOR	100µF,16V
C36	QETC0JM-107	E CAPACITOR	100µF,6.3V
C37	QETC1CM-107	E CAPACITOR	100µF,16V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C38	QETC1AM-107	E CAPACITOR	100μF,10V
	C39	QETB1AM-228	E CAPACITOR	2200μF,10V
	C40	QFL41HJ-103	CAPACITOR	0.01μF,50V
	C41	QETC0JM-107	E CAPACITOR	100μF,6.3V
	C45	QETC1HM-335	E CAPACITOR	3.3μF,50V
	C46	QETC1HM-335	E CAPACITOR	3.3μF,50V
	C47	QFL41HJ-472	CAPACITOR	0.0047μF,50V
	C48	QFL41HJ-472	CAPACITOR	0.0047μF,50V
	C51	QETC1CM-476	E CAPACITOR	47μF,16V
	TP1	PU54983	TEST PIN,X3	
	CN3	PU58844-107	CAP HOUSING	
	CN4	PU60910-110	CAP HOUSING	
	CN6	PU58844-4	CAP HOUSING	
	CN7	PU58844-4	CAP HOUSING	
⚠	CP3	ICP-N20	CIRCUIT PROTECTOR	
⚠	CP4	ICP-N38	CIRCUIT PROTECTOR	
⚠	CP5	ICP-N38	CIRCUIT PROTECTOR	

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MAIN BOARD ASSEMBLY <03> <06>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	PWBA	PB10383B-02	MAIN BOARD ASSY
	PWBA1	PB10383B1-01	MAIN BOARD ASSY
⚠	RF1	PERF0047	RF CONVERTER
⚠	TB1	PQ20989-2	TERMINAL BOARD
	BKT1	PQ32369	BRACKET
	CL1	PU55379	MINI CLAMP
	CL2	PU59311-3	WIRE CLAMP
	CL3	PU59311-4	WIRE CLAMP
	ETH1	PQ43012-1-1	EARTH PLATE
	RV1	PU56800	NYLON RIVET
	SCW1	SDST2605Z	SCREW
	SCW2	SDSF2608Z	SCREW,X2
	SPC1	PU60010	SPACER
	TB2	PU60415A	CONNECTOR BOARD

—AUDIO SECTION—

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	IC1	LA7295	IC	
	Q1	2SC1740S(RS)	TRANSISTOR	
		or 2SC3199(G)	TRANSISTOR	
	Q2	2SC1740S(RS)	TRANSISTOR	
		or 2SC3199(G)	TRANSISTOR	
	Q4	DTA124ES	TRANSISTOR	
	Q5	DTA114ES	TRANSISTOR	
	Q6	2SB810H,J	TRANSISTOR	
	Q7	DTA124ES	TRANSISTOR	
	Q8	DTA124ES	TRANSISTOR	
	Q9	DTA124ES	TRANSISTOR	
	Q10	DTC124ES	TRANSISTOR	
	Q11	DTC124ES	TRANSISTOR	
	Q12	2SC1740S(QRS)	TRANSISTOR	
		or 2SC3199(G)	TRANSISTOR	
	Q13	DTC124ES	TRANSISTOR	
	D1	1SS133	DIODE	
		or MA165	DIODE	
	D2	1SS133	DIODE	
		or MA165	DIODE	
	D3	1SS133	DIODE	
		or MA165	DIODE	
	D4	1SS133	DIODE	
		or MA165	DIODE	
	D5	UZ5.1BSB	ZENER DIODE	
		or RD5.1ES-T1B2	ZENER DIODE	
		or HZS5.1EB2	ZENER DIODE	
	D6	1SS133	DIODE	
		or MA165	DIODE	
	R2	QRD161J-332	RESISTOR	3.3kΩ,1/6W
	R3	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R4	QRD161J-473	RESISTOR	47kΩ,1/6W
	R5	QRD161J-332	RESISTOR	3.3kΩ,1/6W
	R6	QRD161J-682	RESISTOR	6.8kΩ,1/6W
	R7	QRD161J-332	RESISTOR	3.3kΩ,1/6W
	R8	QRD161J-9R1	RESISTOR	9R0Ω,1/6W
	R9	QRD161J-122	RESISTOR	1.2kΩ,1/6W
	R10	QRD161J-122	RESISTOR	1.2kΩ,1/6W
	R11	QRD161J-102	RESISTOR	1kΩ,1/6W
	R12	QRD161J-153	RESISTOR	15kΩ,1/6W
	R13	QRD161J-123	RESISTOR	12kΩ,1/6W
	R14	QRD161J-223	RESISTOR	22kΩ,1/6W
	R15	QRD161J-223	RESISTOR	22kΩ,1/6W
	R16	QRD161J-223	RESISTOR	22kΩ,1/6W
	R17	QRD161J-103	RESISTOR	10kΩ,1/6W
	R18	QRD161J-223	RESISTOR	22kΩ,1/6W
	R19	QRD161J-183	RESISTOR	18kΩ,1/6W
	R20	QRD161J-104	RESISTOR	100kΩ,1/6W
	R21	QRD161J-104	RESISTOR	100kΩ,1/6W
	R22	QRD161J-183	RESISTOR	18kΩ,1/6W
	R23	QRD161J-223	RESISTOR	22kΩ,1/6W
	R24	QRD161J-333	RESISTOR	33kΩ,1/6W
	R25	QRD161J-151	RESISTOR	150Ω,1/6W
	R26	QRD161J-122	RESISTOR	1.2kΩ,1/6W
	R27	QRD161J-153	RESISTOR	15kΩ,1/6W
	R28	QRD161J-392	RESISTOR	3.9kΩ,1/6W
	R29	QRD161J-391	RESISTOR	390Ω,1/6W
	R30	QRD161J-151	RESISTOR	150Ω,1/6W
	R33	QRD161J-561	RESISTOR	560Ω,1/6W
	R34	QRD161J-223	RESISTOR	22kΩ,1/6W
	R35	QRD161J-331	RESISTOR	330Ω,1/6W
	R36	QRD161J-334	RESISTOR	330kΩ,1/6W
	R37	QRD161J-103	RESISTOR	10kΩ,1/6W
	R39	QRD161J-395	RESISTOR	3.9MΩ,1/6W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R40	QRD161J-822	RESISTOR	8.2kΩ,1/6W
	R41	QRD161J-273	RESISTOR	27kΩ,1/6W
	R42	QVZ3523-683AZ	V RESISTOR, AUDIO BIAS	
		or QVZ3518-683AZ	V RESISTOR	
	R43	QRD161J-153	RESISTOR	15kΩ,1/6W
	R44	QRD161J-6R8	RESISTOR	6.8Ω,1/6W
	R45	QRD161J-395	RESISTOR	3.9MΩ,1/6W
	R48	QRD161J-475	RESISTOR	4.7MΩ,1/6W
	R50	QRD161J-103	RESISTOR	10kΩ,1/6W
	R52	QRD161J-103	RESISTOR	10kΩ,1/6W
	R53	QRD161J-332	RESISTOR	3.3kΩ,1/6W
	C1	QCVB1CM-103	CAPACITOR	0.01μF,16V
	C2	QETC1HM-105	E CAPACITOR	1μF,50V
	C3	QETC1CM-476	E CAPACITOR	47μF,16V
	C4	QETC1CM-476	E CAPACITOR	47μF,16V
	C5	QETC1HM-105	E CAPACITOR	1μF,50V
	C6	QFV71HJ-273	TF CAPACITOR	0.027μF,50V
	C7	QFV71HJ-123	TF CAPACITOR	0.012μF,50V
	C8	QFV71HJ-473	TF CAPACITOR	0.047μF,50V
	C9	QFV71HJ-563	TF CAPACITOR	0.056μF,50V
	C10	QETC1EM-335	E CAPACITOR	3.3μF,25V
	C11	QFV71HJ-223	TF CAPACITOR	0.022μF,50V
	C12	QFL31HJ-122	M CAPACITOR	0.0012μF,50V
	C13	QFL31HJ-222	M CAPACITOR	0.0022μF,50V
	C14	QETC1HM-334	E CAPACITOR	0.33μF,50V
	C15	PU60550-105	E CAPACITOR	1μF,50V
	C16	QEB51CM-685	E CAPACITOR	6.8μF,16V
	C17	QFV71HJ-103	TF CAPACITOR	0.01μF,50V
	C18	QETC1HM-105	E CAPACITOR	1μF,50V
	C20	QFL31HJ-272	M CAPACITOR	0.0027μF,50V
	C21	QETC1CM-106	E CAPACITOR	10μF,16V
	C22	QCC11EJ-822	CAPACITOR	0.0082μF,25V
	C23	QCBB1HJ-331	CAPACITOR	330pF,50V
	C24	QFV71HJ-473	TF CAPACITOR	0.047μF,50V
	C25	QETC1CM-106	E CAPACITOR	10μF,16V
	C26	QCXB1CM-272	CAPACITOR	0.0027μF,16V
	C27	QFL31HJ-392	M CAPACITOR	0.0039μF,50V
	C30	QCBB1HJ-102	CAPACITOR	0.001μF,50V
	L1	PU58308-682J	COIL	6.8mH
	L2	PU58308-103J	COIL	10mH
	L3	PU48530-471J	COIL	47μH
⚠	T1	PU60510-2	OSC TRANSFORMER	
	TP1	PU57545	TEST PIN, X3	
⚠	CP1	ICP-F10	CIRCUIT PROTECTOR	

—VIDEO SECTION—

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	IC101	PB20288A	COLOR MODULE ASSY
	IC102	XRA7106LS	IC
		or BA7106LS	IC
	IC201	XRA7106LS	IC
		or BA7106LS	IC
	IC202	PB20227A	COLOR MODULE ASSY
	IC301	LVA522S	IC
		or NJM2234S	IC
	IC302	LVA521S	IC
		or NJM2233BS	IC
		or NJM2233AS	IC
	IC303	M5239L	IC
	IC304	LVA522S	IC
		or NJM2234S	IC
	IC305	M50255P	IC
	IC501	PB20290B	JOG MODULE ASSY
	IC502	LVA522S	IC
		or NJM2234S	IC
	IC503	LVA521S	IC
		or NJM2233BS	IC
		or NJM2233AS	IC
	Q101	2SA1267(YG)-TJK	TRANSISTOR
		or 2SA933S(RS)	TRANSISTOR
	Q102	2SC3199(GB)-TJK	TRANSISTOR
		or 2SC1740(RS)	TRANSISTOR
	Q103	2SC3199(GB)-TJK	TRANSISTOR
		or 2SC1740(RS)	TRANSISTOR
	Q104	2SC3199(GB)-TJK	TRANSISTOR
		or 2SC1740(RS)	TRANSISTOR
	Q105	2SC3199(GB)-TJK	TRANSISTOR
		or 2SC1740(RS)	TRANSISTOR
	Q201	2SC3199(GB)-TJK	TRANSISTOR
		or 2SC1740S(RS)	TRANSISTOR
	Q202	2SA1267(YG)-TJK	TRANSISTOR
		or 2SA933S(RS)	TRANSISTOR
	Q203	2SA1267(YG)-TJK	TRANSISTOR
		or 2SA933S(RS)	TRANSISTOR
	Q204	DTC144ES	TRANSISTOR
	Q205	DTC124ES	TRANSISTOR
	Q206	2SA1267(YG)-TJK	TRANSISTOR
		or 2SA933S(RS)	TRANSISTOR
	Q207	DTA144ES	TRANSISTOR
	Q208	DTC124ES	TRANSISTOR
	Q209	DTC124ES	TRANSISTOR
	Q210	2SC3199(GB)-TJK	TRANSISTOR
		or 2SC1740S(RS)	TRANSISTOR
	Q211	DTC144ES	TRANSISTOR
	Q212	2SC3199(GB)-TJK	TRANSISTOR
		or 2SC1740S(RS)	TRANSISTOR
	Q301	2SC3199(GB)-TJK	TRANSISTOR
		or 2SC1740S(RS)	TRANSISTOR
	Q302	2SC3199(GB)-TJK	TRANSISTOR
		or 2SC1740S(RS)	TRANSISTOR
	Q303	2SC3199(GB)-TJK	TRANSISTOR
		or 2SC1740S(RS)	TRANSISTOR
	Q304	2SC3199(GB)-TJK	TRANSISTOR
		or 2SC1740S(RS)	TRANSISTOR
	Q305	DTA124ES	TRANSISTOR
	Q306	2SC3199(GB)-TJK	TRANSISTOR
		or 2SC1740S(RS)	TRANSISTOR
	Q307	2SC3199(GB)-TJK	TRANSISTOR
		or 2SC1740S(RS)	TRANSISTOR

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	Q309	2SA1267(YG)-TJK	TRANSISTOR
		or 2SA933S(RS)	TRANSISTOR
	Q311	DTC144ES	TRANSISTOR
	Q312	2SC3199(GB)-TJK	TRANSISTOR
		or 2SC1740S(RS)	TRANSISTOR
	Q313	2SA1267(YG)-TJK	TRANSISTOR
		or 2SA933S(RS)	TRANSISTOR
	Q314	2SC3199(GB)-TJK	TRANSISTOR
		or 2SC1740S(RS)	TRANSISTOR
	Q316	DTC144ES	TRANSISTOR
	Q317	2SA1267(YG)-TJK	TRANSISTOR
		or 2SA933S(RS)	TRANSISTOR
	Q318	2SA1267(YG)-TJK	TRANSISTOR
		or 2SA933S(RS)	TRANSISTOR
	Q319	2SA1267(YG)-TJK	TRANSISTOR
		or 2SA933S(RS)	TRANSISTOR
	Q320	DTA124ES	TRANSISTOR
	Q321	DTC124ES	TRANSISTOR
	Q322	2SC3199(GB)-TJK	TRANSISTOR
		or 2SC1740S(RS)	TRANSISTOR
	Q323	2SA1267(YG)-TJK	TRANSISTOR
		or 2SA933S(RS)	TRANSISTOR
	Q324	DTA124ES	TRANSISTOR
	Q325	DTA124ES	TRANSISTOR
	Q326	DTA114ES	TRANSISTOR
	Q327	DTC144ES	TRANSISTOR
	Q501	2SA1267(YG)-TJK	TRANSISTOR
		or 2SA933S(RS)	TRANSISTOR
	Q502	DTC144ES	TRANSISTOR
	Q503	DTC144ES	TRANSISTOR
	Q504	2SC3199(GB)-TJK	TRANSISTOR
		or 2SC1740(RS)	TRANSISTOR
	Q505	2SC3199(GB)-TJK	TRANSISTOR
		or 2SC1740(RS)	TRANSISTOR
	Q506	DTA124ES	TRANSISTOR
	Q509	DTC144ES	TRANSISTOR
	Q510	2SC3199(GB)-TJK	TRANSISTOR
		or 2SC1740(RS)	TRANSISTOR
	Q511	DTA124ES	TRANSISTOR
	D201	1SS133	DIODE
		or MA165	DIODE
	D202	1SS133	DIODE
		or MA165	DIODE
	D203	1SS133	DIODE
		or MA165	DIODE
	D204	1SS133	DIODE
		or MA165	DIODE
	D205	1SS133	DIODE
		or MA165	DIODE
	D206	1SS133	DIODE
		or MA165	DIODE
	D207	1SS133	DIODE
		or MA165	DIODE
	D208	1SS133	DIODE
		or MA165	DIODE
	D209	1SS133	DIODE
		or MA165	DIODE
	D210	1SS133	DIODE

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
		or MA165	DIODE
	D211	1SS133	DIODE
		or MA165	DIODE
	D212	1SS133	DIODE
		or MA165	DIODE
	D213	1SS133	DIODE
		or MA165	DIODE
	D214	1SS133	DIODE
		or MA165	DIODE
	D301	1SS133	DIODE
		or MA165	DIODE
	D302	1SS133	DIODE
		or MA165	DIODE
	D303	1SS133	DIODE
		or MA165	DIODE
	D304	1SS133	DIODE
		or MA165	DIODE
	D305	1SS133	DIODE
		or MA165	DIODE
	D306	1SS133	DIODE
		or MA165	DIODE
	D307	1SS133	DIODE
		or MA165	DIODE
	D308	1SS133	DIODE
		or MA165	DIODE
	D309	1SS133	DIODE
		or MA165	DIODE
	D310	1SS133	DIODE
		or MA165	DIODE
	D311	1SS133	DIODE
		or MA165	DIODE
	D312	1SS133	DIODE
		or MA165	DIODE
	D314	1SS133	DIODE
		or MA165	DIODE
	D315	1SS133	DIODE
		or MA165	DIODE
	D316	1SS133	DIODE
		or MA165	DIODE
	D317	1SS133	DIODE
		or MA165	DIODE
	D318	1SS133	DIODE
		or MA165	DIODE
	D319	1SS133	DIODE
		or MA165	DIODE
	D320	1SS133	DIODE
		or MA165	DIODE
	D321	1SS133	DIODE
		or MA165	DIODE
	D322	1SS133	DIODE
		or MA165	DIODE
	D323	1SS133	DIODE
		or MA165	DIODE
	D325	1SS133	DIODE
		or MA165	DIODE
	D326	1SS133	DIODE
		or MA165	DIODE
	D501	1SS133	DIODE

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	D502	1SS133	DIODE	
		or MA165	DIODE	
	D503	1SS133	DIODE	
		or MA165	DIODE	
	D504	1SS133	DIODE	
		or MA165	DIODE	
	D505	1SS133	DIODE	
		or MA165	DIODE	
	D506	1SS133	DIODE	
		or MA165	DIODE	
	D507	1SS133	DIODE	
		or MA165	DIODE	
	D508	1SS133	DIODE	
		or MA165	DIODE	
	D509	1SS133	DIODE	
		or MA165	DIODE	
	D510	1SS133	DIODE	
		or MA165	DIODE	
	D511	1SS133	DIODE	
		or MA165	DIODE	
	D512	1SS133	DIODE	
		or MA165	DIODE	
	D513	1SS133	DIODE	
		or MA165	DIODE	
	D514	1SS133	DIODE	
		or MA165	DIODE	
	D515	1SS133	DIODE	
		or MA165	DIODE	
	D516	1SS133	DIODE	
		or MA165	DIODE	
	D517	1SS133	DIODE	
		or MA165	DIODE	
	D518	1SS133	DIODE	
		or MA165	DIODE	
	D519	1SS133	DIODE	
		or MA165	DIODE	
	D520	1SS133	DIODE	
		or MA165	DIODE	
	D521	1SS133	DIODE	
		or MA165	DIODE	
	D522	1SS133	DIODE	
		or MA165	DIODE	
	D523	1SS133	DIODE	
	R101	QRD161J-103	RESISTOR	10kΩ,1/6W
	R102	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R103	QRD161J-122	RESISTOR	1.2kΩ,1/6W
	R104	QRD161J-102	RESISTOR	1kΩ,1/6W
	R105	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R106	QRD161J-152	RESISTOR	1.5kΩ,1/6W
	R107	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R108	QRD161J-333	RESISTOR	33kΩ,1/6W
	R109	QRD161J-273	RESISTOR	27kΩ,1/6W
	R110	QRD161J-914	RESISTOR	910kΩ,1/6W
	R111	QRD161J-104	RESISTOR	100kΩ,1/6W
	R112	QRD161J-273	RESISTOR	27kΩ,1/6W
	R113	QRD161J-273	RESISTOR	27kΩ,1/6W
	R114	QRD161J-102	RESISTOR	1kΩ,1/6W
	R202	QRD161J-102	RESISTOR	1kΩ,1/6W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R203	QRD161J-102	RESISTOR	1kΩ,1/6W
	R204	QRD161J-333	RESISTOR	33kΩ,1/6W
	R205	QRD161J-223	RESISTOR	22kΩ,1/6W
	R206	QRD161J-332	RESISTOR	3.3kΩ,1/6W
	R207	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R208	QRD161J-153	RESISTOR	15kΩ,1/6W
	R209	QRD161J-822	RESISTOR	8.2kΩ,1/6W
	R210	QRD161J-182	RESISTOR	1.8kΩ,1/6W
	R211	QRD161J-122	RESISTOR	1.2kΩ,1/6W
	R212	QRD161J-103	RESISTOR	10kΩ,1/6W
	R213	QRD161J-153	RESISTOR	15kΩ,1/6W
	R214	QRD161J-914	RESISTOR	910kΩ,1/6W
	R215	QRD161J-104	RESISTOR	100kΩ,1/6W
	R216	QRD161J-133	RESISTOR	13kΩ,1/6W
	R217	QRD161J-332	RESISTOR	3.3kΩ,1/6W
	R218	QRD161J-103	RESISTOR	10kΩ,1/6W
	R219	QRD161J-333	RESISTOR	33kΩ,1/6W
	R220	QRD161J-273	RESISTOR	27kΩ,1/6W
	R221	QRD161J-103	RESISTOR	10kΩ,1/6W
	R222	QRD161J-223	RESISTOR	22kΩ,1/6W
	R223	QRD161J-112	RESISTOR	1.1kΩ,1/6W
	R224	QRD161J-271	RESISTOR	270Ω,1/6W
	R225	QRD161J-271	RESISTOR	270Ω,1/6W
	R226	QRD161J-391	RESISTOR	390Ω,1/6W
	R227	QRD161J-821	RESISTOR	820Ω,1/6W
	R228	QRD161J-471	RESISTOR	470Ω,1/6W
	R229	QRD161J-102	RESISTOR	1kΩ,1/6W
	R230	QRD161J-102	RESISTOR	1kΩ,1/6W
	R231	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R232	QRD161J-153	RESISTOR	15kΩ,1/6W
	R233	QRD161J-153	RESISTOR	15kΩ,1/6W
	R234	QRD161J-391	RESISTOR	390Ω,1/6W
	R235	QRD161J-102	RESISTOR	1kΩ,1/6W
	R236	QRD161J-273	RESISTOR	27kΩ,1/6W
	R237	QRD161J-102	RESISTOR	1kΩ,1/6W
	R238	QRD161J-102	RESISTOR	1kΩ,1/6W
	R239	QRD161J-332	RESISTOR	3.3kΩ,1/6W
	R240	QRD161J-393	RESISTOR	39kΩ,1/6W
	R241	QRD161J-331	RESISTOR	330Ω,1/6W
	R242	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R243	QRD161J-332	RESISTOR	3.3kΩ,1/6W
	R244	QRD161J-332	RESISTOR	3.3kΩ,1/6W
	R245	QRD161J-682	RESISTOR	6.8kΩ,1/6W
	R246	QRD161J-102	RESISTOR	1kΩ,1/6W
	R301	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R302	QRD161J-333	RESISTOR	33kΩ,1/6W
	R303	QRD161J-333	RESISTOR	33kΩ,1/6W
	R304	QRD161J-102	RESISTOR	1kΩ,1/6W
	R305	QRD161J-102	RESISTOR	1kΩ,1/6W
	R306	QRD161J-102	RESISTOR	1kΩ,1/6W
	R307	QRD161J-182	RESISTOR	1.8kΩ,1/6W
	R308	QRD161J-333	RESISTOR	33kΩ,1/6W
	R309	QRD161J-333	RESISTOR	33kΩ,1/6W
	R310	QRD161J-331	RESISTOR	330Ω,1/6W
	R311	QVZ3518-102AZ	V RESISTOR,PAL REC[illegible]OL	
		or QVZ3518-102	V RESISTOR,PAL REC[illegible]OL	
		or QVZ3523-102	V RESISTOR,PAL REC[illegible]OL	

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	or	QVZ3523-102AZ	V RESISTOR, PAL REC COL	
	R312	QRD161J-333	RESISTOR	33kΩ,1/6W
	R313	QRD161J-333	RESISTOR	33kΩ,1/6W
	R314	QRD161J-122	RESISTOR	1.2kΩ,1/6W
	R315	QRD161J-182	RESISTOR	1.8kΩ,1/6W
	R316	QRD161J-333	RESISTOR	33kΩ,1/6W
	R317	QRD161J-333	RESISTOR	33kΩ,1/6W
	R318	QRD161J-331	RESISTOR	330Ω,1/6W
	R319	QVZ3518-102AZ	V RESISTOR,NTSC REC COL	
	or	QVZ3523-102AZ	V RESISTOR,NTSC REC COL	
	or	QVZ3523-102	V RESISTOR,NTSC REC COL	
	or	QVZ3518-102	V RESISTOR,NTSC REC COL	
	R320	QRD161J-182	RESISTOR	1.8kΩ,1/6W
	R321	QRD161J-333	RESISTOR	33kΩ,1/6W
	R322	QRD161J-333	RESISTOR	33kΩ,1/6W
	R324	QVZ3518-102AZ	V RESISTOR,SECAM REC COL(SP)	
	or	QVZ3523-102AZ	V RESISTOR,SECAM REC COL (SP)	
	or	QVZ3518-102	V RESISTOR,SECAM REC COL (SP)	
	or	QVZ3523-102	V RESISTOR,SECAM REC COL (SP)	
	R326	QRD161J-152	RESISTOR	1.5kΩ,1/6W
	R327	QVZ3518-222AZ	V RESISTOR, REC COL	
	or	QVZ3523-222AZ	V RESISTOR, REC COL	
	or	QVZ3523-222	V RESISTOR, REC COL	
	or	QVZ3518-222	V RESISTOR, REC COL	
	R328	QRD161J-153	RESISTOR	15kΩ,1/6W
	R329	QRD161J-822	RESISTOR	8.2kΩ,1/6W
	R330	QRD161J-101	RESISTOR	100Ω,1/6W
	R331	QRD161J-103	RESISTOR	10kΩ,1/6W
	R333	QRD161J-332	RESISTOR	3.3kΩ,1/6W
	R334	QRD161J-153	RESISTOR	15kΩ,1/6W
	R335	QRD161J-123	RESISTOR	12kΩ,1/6W
	R336	QRD161J-103	RESISTOR	10kΩ,1/6W
	R338	QRD161J-561	RESISTOR	560Ω,1/6W
	R340	QRD161J-332	RESISTOR	3.3kΩ,1/6W
	R341	QRD161J-682	RESISTOR	6.8kΩ,1/6W
	R342	QRD161J-103	RESISTOR	10kΩ,1/6W
	R343	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R344	QRD161J-102	RESISTOR	1kΩ,1/6W
	R345	QRD161J-102	RESISTOR	1kΩ,1/6W
	R346	QRD161J-123	RESISTOR	12kΩ,1/6W
	R347	QRD161J-102	RESISTOR	1kΩ,1/6W
	R348	QRD161J-103	RESISTOR	10kΩ,1/6W
	R349	QRD161J-750	RESISTOR	75Ω,1/6W
	R350	QRD123J-391SX	RESISTOR	390Ω,1/2W
	R351	QRD161J-682	RESISTOR	6.8kΩ,1/6W
	R352	QRD161J-101	RESISTOR	100Ω,1/6W
	R354	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R355	QRD161J-103	RESISTOR	10kΩ,1/6W
	R356	QRD161J-182	RESISTOR	1.8kΩ,1/6W
	R357	QRD161J-183	RESISTOR	18kΩ,1/6W
	R358	QRD161J-103	RESISTOR	10kΩ,1/6W
	R359	QRD161J-102	RESISTOR	1kΩ,1/6W
	R361	QRD161J-101	RESISTOR	100Ω,1/6W
	R362	QVZ3518-332AZ	V RESISTOR,PB EQ(CCIR-SP)	
	or	QVZ3523-332	V RESISTOR,PB EQ (CCIR-SP)	
	or	QVZ3523-332AZ	V RESISTOR,PB EQ (CCIR-SP)	
	or	QVZ3518-332	V RESISTOR,PB EQ (CCIR-SP)	
	R363	QRD161J-152	RESISTOR	1.5kΩ,1/6W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R364	QRD161J-561	RESISTOR	560Ω,1/6W
	R365	QRD161J-333	RESISTOR	33kΩ,1/6W
	R366	QRD161J-153	RESISTOR	15kΩ,1/6W
	R367	QRD161J-182	RESISTOR	1.8kΩ,1/6W
	R368	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R369	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R370	QRD161J-182	RESISTOR	1.8kΩ,1/6W
	R371	QRD161J-182	RESISTOR	1.8kΩ,1/6W
	R372	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R373	QRD161J-471	RESISTOR	470Ω,1/6W
	R374	QRD161J-561	RESISTOR	560Ω,1/6W
	R375	QRD161J-103	RESISTOR	10kΩ,1/6W
	R376	QRD161J-223	RESISTOR	22kΩ,1/6W
	R377	QRD161J-103	RESISTOR	10kΩ,1/6W
	R378	QRD161J-750	RESISTOR	75Ω,1/6W
	R379	QRD161J-103	RESISTOR	10kΩ,1/6W
	R382	QRD161J-103	RESISTOR	10kΩ,1/6W
	R385	QRD161J-101	RESISTOR	100Ω,1/6W
	R387	QRD161J-273	RESISTOR	27kΩ,1/6W
	R501	QRD162J-103	RESISTOR	10kΩ,1/6W
	R502	QRD161J-153	RESISTOR	15kΩ,1/6W
	R503	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R504	QVZ3518-222AZ	V RESISTOR,SECAM REC COL(LP)	
	or	QVZ3523-222AZ	V RESISTOR,SECAM REC COL(LP)	
	or	QVZ3518-222	V RESISTOR,SECAM REC COL(LP)	
	or	QVZ3523-222	V RESISTOR,SECAM REC COL(LP)	
	R505	QRD161J-153	RESISTOR	15kΩ,1/6W
	R506	QVZ3518-332AZ	V RESISTOR, PB EQ (CCIR-LP)	
	or	QVZ3518-332	V RESISTOR, PB EQ (CCIR-LP)	
	or	QVZ3523-332	V RESISTOR, PB EQ (CCIR-LP)	
	or	QVZ3523-332AZ	V RESISTOR, PB EQ (CCIR-LP)	
	R507	QRD161J-333	RESISTOR	33kΩ,1/6W
	R508	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R509	QRD161J-820	RESISTOR	82Ω,1/6W
	R510	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R511	QRD161J-102	RESISTOR	1kΩ,1/6W
	R512	QRD161J-473	RESISTOR	47kΩ,1/6W
	R513	QRD161J-223	RESISTOR	22kΩ,1/6W
	R514	QVZ3518-331AZ	V RESISTOR, DELAYED COL.	
	or	QVZ3523-331AZ	V RESISTOR, DELAYED COL.	
	or	QVZ3523-331	V RESISTOR, DELAYED COL.	
	or	QVZ3518-331	V RESISTOR, DELAYED COL.	
	R515	QRD161J-221	RESISTOR	220Ω, 1/6W
	R516	QRD161J-561	RESISTOR	560Ω, 1/6W
	R517	QRD161J-472	RESISTOR	4.7kΩ, 1/6W
	R518	QRD161J-103	RESISTOR	10kΩ, 1/6W
	R519	QRD161J-472	RESISTOR	4.7kΩ, 1/6W
	R520	QRD161J-103	RESISTOR	10kΩ, 1/6W
	R521	QRD161J-101	RESISTOR	100Ω, 1/6W
	R523	QRD161J-153	RESISTOR	15kΩ, 1/6W
	R526	QRD161J-820	RESISTOR	82Ω, 1/6W
	R530	QRD161J-152	RESISTOR	1.5kΩ, 1/6W
	R531	QRD161J-101	RESISTOR	100Ω, 1/6W
	R532	QRD161J-103	RESISTOR	10kΩ, 1/6W
	R533	QRD161J-182	RESISTOR	1.8kΩ, 1/6W
	R534	QRD161J-472	RESISTOR	4.7kΩ, 1/6W
	R535	QRD161J-472	RESISTOR	4.7kΩ, 1/6W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R536	QRD161J-333	RESISTOR	33kΩ,1/6W
	R537	QRD161J-562	RESISTOR	5.6kΩ,1/6W
	R538	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R539	QRD161J-101	RESISTOR	100Ω,1/6W
	R540	QRD161J-273	RESISTOR	27kΩ,1/6W
	R541	QRD161J-272	RESISTOR	2.7kΩ,1/6W
	R542	QRD161J-821	RESISTOR	820Ω,1/6W
	C102	QCSB1HJ-330	CAPACITOR	33pF,50V
	C103	QCBB1HJ-121	CAPACITOR	120pF,50V
	C104	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C105	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C106	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C107	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C108	QETC1CM-106	E CAPACITOR	10μF,16V
	C109	QETC1EM-335	E CAPACITOR	3.3μF,25V
	C110	QCBB1HJ-471	CAPACITOR	470pF,50V
	C111	QFN31HJ-471	M CAPACITOR	470pF,50V
	C112	QCBB1HJ-151	CAPACITOR	150pF,50V
	C113	QCXB1CN-472	CAPACITOR	0.0047μF,16V
	C114	QCSB1HK-4R7	CAPACITOR	4R0μF,50V
	C115	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C116	QETC0JM-107	E CAPACITOR	100μF,6.3V
	C117	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C118	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C201	QFN31HJ-473	M CAPACITOR	0.047μF,50V
	C202	QCBB1HJ-820	CAPACITOR	82pF,50V
	C203	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C204	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C206	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C207	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C208	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C209	QEK61HM-225	E CAPACITOR	2.2μF,50V
	C210	QEK61HM-335	E CAPACITOR	3.3μF,50V
	C211	QCBB1HJ-471	CAPACITOR	470pF,50V
	C212	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C213	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C214	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C215	QFN31HJ-471	M CAPACITOR	470pF,50V
	C216	QCBB1HJ-101	CAPACITOR	100pF,50V
	C217	QCXB1CN-472	CAPACITOR	0.0047μF,16V
	C218	QCSB1HK-4R7	CAPACITOR	4R0μF,50V
	C219	QCSB1HJ-220	CAPACITOR	22pF,50V
	C220	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C221	QEK60JM-107	E CAPACITOR	100μF,6.3V
	C222	QCSB1HJ-470	CAPACITOR	47pF,50V
	C223	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C224	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C225	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C226	QFN31HJ-563	M CAPACITOR	0.056μF,50V
	C227	QFN31HJ-224	M CAPACITOR	0.22μF,50V
	C228	QETC1HM-475	E CAPACITOR	4.7μF,50V
	C229	QETC1HM-474	E CAPACITOR	0.47μF,50V
	C230	QCSB1HJ-150	CAPACITOR	15pF,50V
	C231	QETC1CM-106	E CAPACITOR	10μF,16V
	C232	QEK60JM-107	E CAPACITOR	100μF,6.3V
	C234	QCVB1CN-103	CAPACITOR	0.01μF,16V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C235	QETC1HM-474	E CAPACITOR	0.47μF,50V
	C236	QETC0JM-337	E CAPACITOR	330μF,6.3V
	C237	QCFB1EZ-223	CAPACITOR	0.022μF,25V
	C238	QETC1HM-224	E CAPACITOR	0.22μF,50V
	C301	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C302	QCBB1HJ-102	CAPACITOR	0.001μF,50V
	C303	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C304	QEK60JM-476	E CAPACITOR	47μF,6.3V
	C305	QEK60JM-476	E CAPACITOR	47μF,6.3V
	C306	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C307	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C308	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C309	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C310	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C311	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C312	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C313	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C314	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C315	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C316	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C319	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C320	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C321	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C322	QETC1HM-105	E CAPACITOR	1μF,50V
	C323	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C324	QETC0JM-477	E CAPACITOR	470μF,6.3V
	C325	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C326	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C327	QETC1CM-106	E CAPACITOR	10μF,16V
	C328	QFN31HJ-123	M CAPACITOR	0.012μF,50V
	C329	QFN31HJ-123	M CAPACITOR	0.012μF,50V
	C330	QCSB1HJ-390	CAPACITOR	39pF,50V
	C331	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C332	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C333	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C334	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C335	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C336	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C337	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C338	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C339	QCSB1HJ-470	CAPACITOR	47pF,50V
	C340	QCBB1HJ-121	CAPACITOR	120pF,50V
	C341	QCBB1HJ-121	CAPACITOR	120pF,50V
	C342	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C343	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C344	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C345	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C346	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C347	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C348	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C349	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C350	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C351	QEK60JM-476	E CAPACITOR	47μF,6.3V
	C352	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C353	QFN31HJ-473	M CAPACITOR	0.047μF,50V
	C354	QEP61AM-226	NP E CAPACITOR	22μF,10V
	C357	QCVB1CN-103	CAPACITOR	0.01μF,16V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C358	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C359	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C360	QCBB1HJ-221	CAPACITOR	220pF,50V
	C361	QCSB1HJ-390	CAPACITOR	39pF,50V
	C362	QETC1CM-106	E CAPACITOR	10μF,16V
	or	QET61CM-106	E CAPACITOR	10μF,16V
	C501	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C502	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C503	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C504	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C505	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C506	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C507	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C508	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C509	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C512	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C516	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C517	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C518	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C519	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C520	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C522	QCVB1CN-103	CAPACITOR	0.01μF,16V
	L101	PU48530-101K	COIL	100μH
	L102	PU48530-101K	COIL	100μH
	L103	PU59152-390J	COIL	39μH
	L104	PU60655	COIL	
	L105	PU48530-101K	COIL	100μH
	L201	PU48530-222J	COIL	222μH
	L202	PU59152-330J	COIL	33μH
	L203	PU48530-101K	COIL	100μH
	L204	PU48530-271J	COIL	270μH
	L205	PU59153-822J	COIL	8.2mH
	L206	PU48530-101K	COIL	100μH
	L207	PU60655	COIL	
	L301	PU48530-101K	COIL	100μH
	L302	PU48530-101K	COIL	100μH
	L303	PU48530-101K	COIL	100μH
	L304	PU48530-180J	COIL	18μH
	L305	PU48530-101K	COIL	100μH
	L306	PU59152-180J	COIL	18μH
	L307	PU48530-101K	COIL	100μH
	L308	PU59152-101K	COIL	100μH
	L309	PU59152-120J	COIL	12μH
	L310	PU59152-221J	COIL	220μH
	L311	PU59152-560J	COIL	56μH
	L312	PU48530-101K	COIL	100μH
	L313	PU48530-101K	COIL	100μH
	L314	PU48530-101K	COIL	100μH
	L315	PU48530-222J	COIL	222μH
	L316	PU59152-470J	COIL	47μH
	L501	PU59152-150J	COIL	15μH
	L502	PU59152-150J	COIL	15μH
	L503	PU48530-101K	COIL	100μH
	L506	PU48530-101K	COIL	100μH

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	L507	PU48530-101K	COIL	100μH
	L508	PU48530-101K	COIL	100μH
	EQ101	PU53501-11	EQUALIZER	
	or	PU53501-6	EQUALIZER	
	EQ201	PU53501-11	EQUALIZER	
	or	PU53501-6	EQUALIZER	
	EQ302	PU54838	EQUALIZER	
	or	PU60714	EQUALIZER	
	LPF201	PU58022	LOW PASS FILTER	
	LPF301	PU60128-2	LOW PASS FILTER	
	BPF201	PU61096	BAND PASS FILTER	
	BPF202	PU60654-2	BAND PASS FILTER	
	or	PU60654	BAND PASS FILTER	
	CF201	PU57073	CERAMIC FILTER	
	DL201	PU60496	DELAY LINE	
	DL202	PU60340-02	COMB FILTER	
	or	PU60490	COMB FILTER	
	or	PU60222	2H DELAY LINE	
	DL301	PU60058-2	DELAY LINE	
	or	PU60322	DELAY LINE	
	or	PU60058	DELAY LINE	
	DL501	PU54819	DELAY LINE	
	LC101	PU61087	COIL, REC COL	
	or	PU60221	COIL	
	LC102	PU61086	COIL, PB BELL	
	or	PU60220	COIL	
⚠	X201	PU60653	CRYSTAL UNITS	
	TP1	PU57545	TEST PIN, X5	
	TP2	PU57545	TEST PIN, X2	
	TP3	PU57545	TEST PIN, X5	
	TP4	PU50766-2	TEST PIN, X5	
	CN101	PU58844-4	CAP HOUSING	
	CN301	PU59555-4	CAP HOUSING	
	CN304	PU58844-6	CAP HOUSING	
	CN305	PU59555-7	CAP HOUSING	
	CN307	PU59555-4	CAP HOUSING	
	CN308	PU59555-13	CAP HOUSING	
	CN309	PU58844-8	CAP HOUSING	
	CN310	PU58844-2	CAP HOUSING	

—TERMINAL BOARD ASSEMBLY <16>—

REF. No.	PART No.	PART NAME, DESCRIPTION
PWBA2	PB10383A2	TERMINAL BOARD ASSEMBLY
J701	PU60659	MINI JACK

—TERMINAL SECTION—

REF. No.	PART No.	PART NAME, DESCRIPTION
Q701	2SB810H,J	TRANSISTOR
D701	1SS133	DIODE

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
		or MA165	DIODE	
	R701	QRD161J-393	RESISTOR	39kΩ,1/6W
	R702	QRD161J-102	RESISTOR	1kΩ,1/6W
	R704	QRD161J-0R0	RESISTOR	0Ω,1/6W
	C704	QCBB1HJ-561	CAPACITOR	560pF,50V
	C705	QCBB1HJ-102	CAPACITOR	0.001μF,50V
	C711	QCBB1HJ-101	CAPACITOR	100pF,50V
	L701	PU59152-R22J	COIL	0.22μH
	L702	PU59152-R22J	COIL	0.22μH
	L703	PU59152-5R6J	COIL	5.6μH
	L704	PU59152-5R6J	COIL	5.6μH
	L706	PU59152-R22J	COIL	0.22μH
	L707	PU59152-R22J	COIL	0.22μH
	K701	PU60281-5	FERRITE BEADS	
	K702	PU60281-5	FERRITE BEADS	
	CN701	PU58844-5	CAP HOUSING	

—JUMP DET. BOARD ASSEMBLY <70>—

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA3	PB30081A	JUMP DET BOARD ASSY	
	IC401	BA7023L	IC	
	IC402	BU4030B	IC	
	IC403	BA222	IC	
	IC404	TC4013BP	IC	
	Q401	2SA1267(YG)-TJK	TRANSISTOR	
		or 2SA933S(RS)	TRANSISTOR	
		or 2SA1309R,S	TRANSISTOR	
	Q611	DTC124ES	TRANSISTOR	
	D411	1SS133	DIODE	
		or MA165	DIODE	
	D611	1SS133	DIODE	
		or MA165	DIODE	
	D612	1SS133	DIODE	
		or MA165	DIODE	
	D613	1SS133	DIODE	
		or MA165	DIODE	
	D614	1SS133	DIODE	
		or MA165	DIODE	
	D617	1SS133	DIODE	
		or MA165	DIODE	
	R401	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R402	QRD161J-391	RESISTOR	390Ω,1/6W
	R403	QRD161J-223	RESISTOR	22kΩ,1/6W
	R404	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R405	QRD161J-124	RESISTOR	120kΩ,1/6W
	R406	QRD161J-184	RESISTOR	180kΩ,1/6W
	R407	QRD161J-823	RESISTOR	82kΩ,1/6W
	R408	QRD161J-153	RESISTOR	15kΩ,1/6W
	R409	QRD161J-105	RESISTOR	1MΩ,1/6W
	R410	QVZ3521-473	V RESISTOR, 0.5H JUMP DET	
	R411	QRD161J-105	RESISTOR	1MΩ,1/6W
	R412	QRD161J-473	RESISTOR	47kΩ,1/6W
	R413	QRD161J-104	RESISTOR	100kΩ,1/6W
	R414	QRD161J-223	RESISTOR	22kΩ,1/6W
	R633	QRD161J-103	RESISTOR	10kΩ,1/6W
	R643	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R644	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R645	QRD161J-103	RESISTOR	10kΩ,1/6W
	C401	QFN31HJ-152	M CAPACITOR	0.0015μF,50V
	C402	QETC1HM-105	E CAPACITOR	1μF,50V
	C403	QFN31HJ-222	M CAPACITOR	0.0022μF,50V
	C404	QFN31HJ-332	M CAPACITOR	0.0033μF,50V
	C405	QEK61CM-106	E CAPACITOR	10μF,16V
	C406	QETC0JM-107	E CAPACITOR	100μF,6.3V
	C407	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C408	QFN31HJ-103	M CAPACITOR	0.01μF,50V
	C409	QFN31HJ-273	M CAPACITOR	0.027μF,50V
	C410	QETC1HM-105	E CAPACITOR	1μF,50V
	C411	QCBB1HJ-331	CAPACITOR	330pF,50V
	C412	QETC1HM-105	E CAPACITOR	1μF,50V
	C413	QFN31HJ-103	M CAPACITOR	0.01μF,50V
	C414	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C415	QFN31HJ-273	M CAPACITOR	0.027μF,50V
	C416	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C417	QETC1AM-476	E CAPACITOR	47μF,10V
	L401	PU48530-101K	COIL	100μH
	L402	PU48530-101K	COIL	100μH
	JP401	PU60330-114	TERMINAL	
	JP402	PU60330-104	TERMINAL	

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MECHACON BOARD ASSEMBLY < 04>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB20456B	MECHACON BOARD ASSY	
	IC601	M37418M6-269SP	IC	
	Q601	DTC144ES	TRANSISTOR	
	D601	HZS7.5EB2	ZENER DIODE	
		or MTZ7.5B	ZENER DIODE	
	D602	1SS133	DIODE	
		or MA165	DIODE	
	D603	1SS133	DIODE	
		or MA165	DIODE	
	D604	1SS133	DIODE	
		or MA165	DIODE	
	D605	1SS133	DIODE	
		or MA165	DIODE	
	R601	QRD161J-332	RESISTOR	3.3kΩ,1/6W
	R602	QRD161J-332	RESISTOR	3.3kΩ,1/6W
	R603	QRD161J-103	RESISTOR	10kΩ,1/6W
	R604	QRD161J-472	RESISTOR	4.7kΩ,1/6W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R605	QRD161J-102	RESISTOR	1kΩ,1/6W
	R606	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R607	QRD161J-102	RESISTOR	1kΩ,1/6W
	R608	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R609	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R610	QRD161J-102	RESISTOR	1kΩ,1/6W
	R611	QRD161J-102	RESISTOR	1kΩ,1/6W
	R612	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R613	QRD161J-153	RESISTOR	15kΩ,1/6W
	R614	QRD161J-103	RESISTOR	10kΩ,1/6W
	R615	QRD161J-471	RESISTOR	470Ω,1/6W
	R616	QRD161J-103	RESISTOR	10kΩ,1/6W
	R617	QRD161J-105	RESISTOR	1MΩ,1/6W
	R618	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R619	QRD161J-103	RESISTOR	10kΩ,1/6W
	R620	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R621	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R622	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R623	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R624	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R625	QRD161J-103	RESISTOR	10kΩ,1/6W
	R626	QRD161J-102	RESISTOR	1kΩ,1/6W
	R627	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R628	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R629	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R630	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R631	QRD161J-102	RESISTOR	1kΩ,1/6W
	R632	QRD161J-471	RESISTOR	470Ω,1/6W
	R633	QRD161J-103	RESISTOR	10kΩ,1/6W
	R634	QRD161J-822	RESISTOR	8.2kΩ,1/6W
	R635	QRD161J-563	RESISTOR	56kΩ,1/6W
	R636	QRD161J-124	RESISTOR	120kΩ,1/6W
	R637	QRD161J-333	RESISTOR	33kΩ,1/6W
	R638	QRD161J-393	RESISTOR	39kΩ,1/6W
	R639	QRD161J-224	RESISTOR	220kΩ,1/6W
	R640	QRD161J-103	RESISTOR	10kΩ,1/6W
	R641	QRD161J-103	RESISTOR	10kΩ,1/6W
	R642	QRD161J-103	RESISTOR	10kΩ,1/6W
	R643	QRD161J-103	RESISTOR	10kΩ,1/6W
	R644	QRD161J-152	RESISTOR	1.5kΩ,1/6W
	R645	QRD161J-333	RESISTOR	33kΩ,1/6W
	R646	QRD161J-102	RESISTOR	1kΩ,1/6W
	R647	QRD161J-103	RESISTOR	10kΩ,1/6W
	R648	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	RA601	QRB035J-103XC	RESISTOR ARRAY	
	C601	QEK61HM-105	E CAPACITOR	1μF,50V
	C602	QEK60JM-107	E CAPACITOR	100μF,6.3V
	C603	QEK61EM-335	E CAPACITOR	3.3μF,25V
	C604	QCFB1EZ-223	CAPACITOR	0.022μF,25V
	C605	QCC11EK-104	CAPACITOR	0.1μF,25V
	C606	QCBB1HJ-121	CAPACITOR	120pF,50V
	C608	QCBB1HJ-471	CAPACITOR	470pF,50V
	C609	QETC1CM-337	E CAPACITOR	330μF,16V
	L601	PU59152-2R2J	COIL	2.2μH
⚠	CF601	PU60440	RESONATOR	
⚠	or	PU60440-2	C RESONATER	
	TH601	NTH5D473KB	THERMISTOR	
	or	ERT-D2ZHK473S	NEGA THERMISTOR	
	TP601	PU57545	TEST PIN	
	TP602	PU57545	TEST PIN	
	CN601	PEMC0722-014	WIRE TRAP	
	or	PEMC0753-014	WIRE TRAP	
	CN602	PU59555-4	CAP HOUSING	
	CN603	PU59933-8	WIRE TRAP	
	CN604	PU61044-10	CAP HOUSING	
	CN605	PU58844-13	CAP HOUSING	
	CN606	PU59555-8	CAP HOUSING	
	CN607	PU59555-13	CAP HOUSING	
	CN608	PU59555-4	CAP HOUSING	
	CN609	PU59555-2	CAP HOUSING	
	CN610	PU59933-12	WIRE TRAP	
⚠	CP601	ICP-F25	CIRCUIT PROTECTOR	

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VIDEO UNIT BOARD ASSEMBLY <05>

	PWBA	PB10385A-02	VIDEO UNIT BOARD ASSEMBLY
	IC1	PB20166F	Y MODULE ASSY
⚠	IC2	MSM6866RS	IC
⚠	IC3	MSM6967RS	IC
	IC4	BA7131F	IC
	IC201	PU22517C	COLOR MODULE ASSY
	Q1	DTC124EU	TRANSISTOR
	Q2	DTC124EU	TRANSISTOR
	Q3	DTA144WU	TRANSISTOR
	Q4	DTC144EU	TRANSISTOR
	Q5	DTA124EU	TRANSISTOR
	Q7	DTA144EU	TRANSISTOR
	Q8	2SC4081(RS)	TRANSISTOR
	Q9	DTC144EU	TRANSISTOR
	Q11	2SA1576(RS)	TRANSISTOR
	Q12	2SC4081(RS)	TRANSISTOR
	Q13	2SA1576(RS)	TRANSISTOR
	Q14	2SC4081(RS)	TRANSISTOR
	Q15	DTA114EU	TRANSISTOR
	Q16	DTC144EU	TRANSISTOR
	Q201	DTC144WU	TRANSISTOR
	D1	DAN202U	DIODE
	D2	1SS133	DIODE
	or	MA165	DIODE
	D3	DAN202U	DIODE
	D4	1SS133	DIODE
	or	MA165	DIODE
	D5	1SS292	DIODE
	D6	DAP202U	DIODE
	D7	DAP202U	DIODE

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	D9	RD9.1ESB2	ZENER DIODE	
		or UZ9.1BSB	ZENER DIODE	
	D10	RD9.1ESB2	ZENER DIODE	
		or UZ9.1BSB	ZENER DIODE	
	D11	DAN202U	DIODE	
	D12	1SS133	DIODE	
		or MA165	DIODE	
	D13	1SS133	DIODE	
		or MA165	DIODE	
	D14	1SS133	DIODE	
		or MA165	DIODE	
	D201	1SS133	DIODE	
		or MA165	DIODE	
	D202	DA204U	DIODE	
	D204	DAP202U	DIODE	
	D205	DAP202U	DIODE	
	R1	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R2	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R3	QRSA08J-272YN	RESISTOR	2.7kΩ,1/10W
	R4	QRD161J-103	RESISTOR	10kΩ,1/6W
	R5	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R6	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R8	QRSA08J-681YN	RESISTOR	680Ω,1/10W
	R9	QRSA08J-272YN	RESISTOR	2.7kΩ,1/10W
	R10	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R11	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R12	QRSA08J-104	RESISTOR	100kΩ,1/10W
	R13	QRSA08J-272YN	RESISTOR	2.7kΩ,1/10W
	R14	QRSA08J-334YN	RESISTOR	330kΩ,1/10W
	R15	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R16	QRSA08J-221YN	RESISTOR	220Ω,1/10W
	R17	QRSA08J-222	RESISTOR	2.2kΩ,1/10W
	R18	QRSA08J-221YN	RESISTOR	220Ω,1/10W
	R20	QRD161J-102	RESISTOR	1kΩ,1/6W
	R21	QVZ3518-222	V RESISTOR,NTSC NC BAL	
		or QVZ3523-222	V RESISTOR,NTSC NC BAL	
	R22	QRSA08J-182YN	RESISTOR	1.8kΩ,1/10W
	R23	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R24	QRSA08J-392YN	RESISTOR	3.9kΩ,1/10W
	R25	QRSA08J-181YN	RESISTOR	180Ω,1/10W
	R26	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R27	QVZ3518-222	V RESISTOR,PAL NC BAL	
		or QVZ3523-222AZ	V RESISTOR,PAL NC BAL	
		or QVZ3518-222AZ	V RESISTOR,PAL NC BAL	
		or QVZ3523-222	V RESISTOR,PAL NC BAL	
	R28	QRSA08J-222	RESISTOR	2.2kΩ,1/10W
	R29	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R30	QRSA08J-181YN	RESISTOR	180Ω,1/10W
	R31	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R33	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R34	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R201	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R202	QRD161J-155	RESISTOR	1.5MΩ,1/6W
	R203	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R204	QRSA08J-273YN	RESISTOR	27kΩ,1/10W
	R205	QRSA08J-331YN	RESISTOR	330Ω,1/10W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R206	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R207	QRSA08J-222	RESISTOR	2.2kΩ,1/10W
	R208	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R209	QRSA08J-101YN	RESISTOR	100Ω,1/10W
	C1	QCSA1HJ-220	CAPACITOR	22pF,50V
	C2	QCSA1HJ-330	CAPACITOR	33pF,50V
	C3	QCSA1HJ-180	CAPACITOR	18pF,50V
	C4	QETC1AM-226	E CAPACITOR	22μF,10V
	C5	QETC1HM-335	E CAPACITOR	3.3μF,50V
	C6	QCSA1HJ-120	CAPACITOR	12pF,50V
	C7	QCSA1HG-180	CAPACITOR	18pF,50V
	C9	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C10	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C11	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C12	QCSA1HJ-220	CAPACITOR	22pF,50V
	C13	QCSA1HJ-270	CAPACITOR	27pF,50V
	C14	QENC1AM-336	NP E CAPACITOR	33μF,10V
	C15	QETC1CM-106	E CAPACITOR	10μF,16V
	C16	QETC1HM-224	E CAPACITOR	0.22μF,50V
	C17	QETC1EM-335	E CAPACITOR	3.3μF,25V
	C18	QENC1EM-335	NP E CAPACITOR	3.3μF,25V
	C19	QCC11EJ-823	CAPACITOR	0.082μF,25V
	C20	QETC0JM-337	E CAPACITOR	330μF,6.3V
	C21	QETC1EM-475	E CAPACITOR	4.7μF,25V
	C22	QEK61HM-334	E CAPACITOR	0.33μF,50V
	C23	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C24	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C25	QETC1HM-334	E CAPACITOR	0.33μF,50V
	C26	QEK61EM-475	E CAPACITOR	4.7μF,25V
	C27	QCSA1HJ-330	CAPACITOR	33pF,50V
	C28	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C29	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C30	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C31	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C32	QETC1AM-476	E CAPACITOR	47μF,10V
	C33	QETC1HM-225	E CAPACITOR	2.2μF,50V
	C34	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C35	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C36	QETC1EM-475	E CAPACITOR	4.7μF,25V
	C37	QETC1HM-104	E CAPACITOR	0.1μF,50V
	C38	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C39	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C40	QETC1HM-334	E CAPACITOR	0.33μF,50V
	C41	QETB1EM-475	E CAPACITOR	4.7μF,25V
	C42	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C43	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C44	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C45	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C46	QETC1AM-476	E CAPACITOR	47μF,10V
	C47	QCSA1HJ-151	CAPACITOR	150pF,50V
	C48	QFN31HJ-563	M CAPACITOR	0.056μF,50V
	C201	QETC1HM-105	E CAPACITOR	1μF,50V
	C202	QETC0JM-337	E CAPACITOR	330μF,6.3V
	C203	QETC1EM-475	E CAPACITOR	4.7μF,25V
	C204	QETC1HM-104	E CAPACITOR	0.1μF,50V
	C207	QETC1HM-224	E CAPACITOR	0.22μF,50V
	C208	QCSA1HJ-680	CAPACITOR	68pF,50V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C209	QETC0JM-337	E CAPACITOR	330μF,6.3V
	C210	QETC1EM-335	E CAPACITOR	3.3μF,25V
	C213	QETC1HM-474	E CAPACITOR	0.47μF,50V
	L2	PU59152-121J	COIL	120μH
	L3	PU59152-680J	COIL	68μH
	L4	PU48530-820J	COIL	82μH
	L5	PU59152-680J	COIL	68μH
	L6	PU59152-680J	COIL	68μH
	L7	PU59153-101K	COIL	100μH
	L8	PU59152-680J	COIL	68μH
	L9	PU48530-101K	COIL	100μH
	L10	PU48530-101K	COIL	100μH
	L11	PU48530-101K	COIL	100μH
	L12	PU48530-101K	COIL	100μH
	L13	PU48530-101K	COIL	100μH
	L201	PU59153-101K	COIL	100μH
	EQ1	PU60381	EQUALIZER	
	EQ2	PU60162	EQUALIZER	
		or PU60162-2	EQUALIZER	
	LPF1	PU60380	LOW PASS FILTER	
	LPF2	PU60055	LOW PASS FILTER	
	LPF3	PU60716	LOW PASS FILTER	
	BPF201	PELN0313	BAND PASS FILTER	
	CF201	PU58852	CERAMIC FILTER	
	LC201	PU60057-3	TANK FILTER	
		or PU60057-2	TANK FILTER	
⚠	X201	PU60059	CRYSTAL RESONATOR	
	SLD1	PU61241	SHIELD CASE	
	SLD2	PU61242	SHIELD PLATE	
	SLD3	PU61243	SHIELD COVER	
	TP1	PU55774	TEST PIN, X2	
	CN1	PEMC0712-112	PIN HEADER	
	CN2	PEMC0712-115	PIN HEADER	
	CN3	PEMC0712-112	PIN HEADER	

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IF BOARD ASSEMBLY <07>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB10372A-03	IF BOARD ASSY	
	IC1	M51419ASP	IC	
	Q1	2SC3932(ST)	TRANSISTOR	
	Q2	2SC3936(BC)	TRANSISTOR	
	Q3	2SA1532(BC)	TRANSISTOR	
	Q4	2SC3354	TRANSISTOR	
	Q5	DTC123EU	TRANSISTOR	
	Q6	2SC3354	TRANSISTOR	
	Q7	DTC123EU	TRANSISTOR	
	Q8	2SC3936(BC)	TRANSISTOR	
	Q11	2SB1219(RS)	TRANSISTOR	
	Q12	2SD1819A(RS)	TRANSISTOR	
	Q13	2SB1218A(RS)	TRANSISTOR	
	Q14	2SD1819A(RS)	TRANSISTOR	
	Q15	2SB1218A(RS)	TRANSISTOR	
	Q16	2SB1218A(RS)	TRANSISTOR	
	Q17	DTA114EU	TRANSISTOR	
	Q18	DTA114TU	TRANSISTOR	
	Q19	2SK381(C)	FE TRANSISTOR	
	Q20	DTC144EU	TRANSISTOR	
	Q21	2SB709(QR)	TRANSISTOR	
	Q22	DTC144EU	TRANSISTOR	
	Q24	2SD1863(QR)	TRANSISTOR	
	Q25	DTC123EU	TRANSISTOR	
	D1	MA157	DIODE	
	D2	1SS133	DIODE	
	D3	1SS133	DIODE	
	D4	DAP202U	DIODE	
	D5	RD10ES-T1B1	ZENER DIODE	
	R1	NRSA63J-332N	RESISTOR	3.3kΩ,1/16W
	R2	NRSA63J-183N	RESISTOR	18kΩ,1/16W
	R3	NRSA63J-101N	RESISTOR	100Ω,1/16W
	R4	NRSA63J-561N	RESISTOR	560Ω,1/16W
	R5	NRSA63J-101N	RESISTOR	100Ω,1/16W
	R6	NRSA63J-560N	RESISTOR	56Ω,1/16W
	R7	NRSA63J-222N	RESISTOR	2.2kΩ,1/16W
	R8	QRSA08J-271YN	RESISTOR	270Ω,1/10W
	R9	NRSA63J-561N	RESISTOR	560Ω,1/16W
	R10	NRSA63J-682N	RESISTOR	6.8kΩ,1/16W
	R11	NRSA63J-682N	RESISTOR	6.8kΩ,1/16W
	R12	NRSA63J-471N	RESISTOR	470Ω,1/16W
	R13	NRSA63J-241N	RESISTOR	240Ω,1/16W
	R14	NRSA63J-221N	RESISTOR	220Ω,1/16W
	R15	NRSA63J-222N	RESISTOR	2.2kΩ,1/16W
	R16	NRSA63J-472N	RESISTOR	4.7kΩ,1/16W
	R17	NRSA63J-183N	RESISTOR	18kΩ,1/16W
	R18	QRSA08J-271YN	RESISTOR	270Ω,1/10W
	R19	NRSA63J-681N	RESISTOR	680Ω,1/16W
	R20	NRSA63J-151N	RESISTOR	150Ω,1/16W
	R21	NRSA63J-224N	RESISTOR	220kΩ,1/16W
	R22	QRSA08J-271YN	RESISTOR	270Ω,1/10W
	R23	NRSA63J-821N	RESISTOR	820Ω,1/16W
	R24	NRSA63J-680N	RESISTOR	68Ω,1/16W
	R25	NRSA63J-224N	RESISTOR	220kΩ,1/16W
	R26	QRSA08J-271YN	RESISTOR	270Ω,1/10W
	R27	QRSA08J-271YN	RESISTOR	270Ω,1/10W
	R28	NRSA63J-562N	RESISTOR	5.6kΩ,1/16W
	R29	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R30	NRSA63J-682N	RESISTOR	6.8kΩ,1/16W
	R31	QVZ3518-103	V RESISTOR, SECAM Y LEVEL	
	R32	NRSA63J-392N	RESISTOR	3.9kΩ,1/16W
	R33	NRSA63J-303N	RESISTOR	30kΩ,1/16W
	R35	NRSA63J-182N	RESISTOR	1.8kΩ,1/16W
	R36	QVZ3518-223	V RESISTOR, RF AGC	

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R37	NRSA63J-182N	RESISTOR	1.8kΩ,1/16W
	R41	NRSA63J-275N	RESISTOR	2.7MΩ,1/16W
	R42	NRSA63J-332N	RESISTOR	3.3kΩ,1/16W
	R43	NRSA63J-222N	RESISTOR	2.2kΩ,1/16W
	R44	NRSA63J-684N	RESISTOR	680kΩ,1/16W
	R45	NRSA63J-303N	RESISTOR	30kΩ,1/16W
	R46	NRSA63J-562N	RESISTOR	5.6kΩ,1/16W
	R47	NRSA63J-271N	RESISTOR	270Ω,1/16W
	R48	NRSA63J-331N	RESISTOR	330Ω,1/16W
	R49	NRSA63J-124N	RESISTOR	120kΩ,1/16W
	R50	NRSA63J-124N	RESISTOR	120kΩ,1/16W
	R51	NRSA63J-272N	RESISTOR	2.7kΩ,1/16W
	R52	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R53	QRD181J-103	RESISTOR	10kΩ,1/8W
	R54	NRSA63J-621N	RESISTOR	620Ω,1/16W
	R55	NRSA63J-472N	RESISTOR	4.7kΩ,1/16W
	R56	QRD161J-392	RESISTOR	3.9kΩ,1/6W
	R58	NRSA63J-153N	RESISTOR	15kΩ,1/16W
	R59	NRSA63J-153N	RESISTOR	15kΩ,1/16W
	R60	NRSA63J-223N	RESISTOR	22kΩ,1/16W
	R61	NRSA63J-681N	RESISTOR	680Ω,1/16W
	R62	QRSA08J-221YN	RESISTOR	220Ω,1/10W
	R63	NRSA63J-221N	RESISTOR	220Ω,1/16W
	R65	NRSA63J-391N	RESISTOR	390Ω,1/16W
	R66	NRSA63J-470N	RESISTOR	47Ω,1/16W
	R67	NRSA63J-750N	RESISTOR	75Ω,1/16W
	R68	NRSA63J-104N	RESISTOR	100kΩ,1/16W
	R69	NRSA63J-562N	RESISTOR	5.6kΩ,1/16W
	R70	QVZ3518-682	V RESISTOR, PAL Y LEVEL	
	R71	NRSA63J-181N	RESISTOR	180Ω,1/16W
	R72	NRSA63J-471N	RESISTOR	470Ω,1/16W
	R73	NRSA63J-184N	RESISTOR	180kΩ,1/16W
	R74	NRSA63J-101N	RESISTOR	100Ω,1/16W
	R75	NRSA63J-391N	RESISTOR	390Ω,1/16W
	R76	NRSA63J-821N	RESISTOR	820Ω,1/16W
	R77	NRSA63J-272N	RESISTOR	2.7kΩ,1/16W
	R78	NRSA63J-102N	RESISTOR	1kΩ,1/16W
	R79	NRSA63J-561N	RESISTOR	560Ω,1/16W
	R80	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R81	QRD161J-392	RESISTOR	3.9kΩ,1/6W
	R82	NRSA63J-223N	RESISTOR	22kΩ,1/16W
	R83	NRSA63J-154N	RESISTOR	150kΩ,1/16W
	R84	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R85	NRSA63J-105N	RESISTOR	1MΩ,1/16W
	R87	QRSA08J-222	RESISTOR	2.2kΩ,1/10W
	R88	NRSA63J-182N	RESISTOR	1.8kΩ,1/16W
	R89	NRSA63J-564N	RESISTOR	560kΩ,1/16W
	R90	NRSA63J-471N	RESISTOR	470Ω,1/16W
	R91	QRSA08J-101YN	RESISTOR	100Ω,1/10W
	R93	NRSA63J-331N	RESISTOR	330Ω,1/16W
	R94	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R95	NRSA63J-152N	RESISTOR	1.5kΩ,1/16W
	R96	NRSA63J-470N	RESISTOR	47Ω,1/16W
	R97	NRSA63J-102N	RESISTOR	1kΩ,1/16W
	R98	NRSA63J-332N	RESISTOR	3.3kΩ,1/16W
	R100	QRD161J-181	RESISTOR	180Ω,1/6W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C1	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C2	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C3	NCT06CH-150A	CAPACITOR	15pF,50V
	C4	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C5	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C6	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C7	NCT06CH-6R0A	CAPACITOR	6pF,50V
	C8	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C9	NCT06CH-5R0A	CAPACITOR	5pF,50V
	C10	NCT06CH-2R0A	CAPACITOR	2pF,50V
	C11	NCT06CH-3R0A	CAPACITOR	3pF,50V
	C12	NCT06CH-3R0A	CAPACITOR	3pF,50V
	C13	NCT06CH-121A	CAPACITOR	120pF,50V
	C14	QCBB1HJ-102	CAPACITOR	0.001μF,50V
	C15	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C16	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C17	QCYA1HK-222	CAPACITOR	0.0022μF,50V
	C18	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C19	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C20	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C21	QCYA1HK-222	CAPACITOR	0.0022μF,50V
	C22	QCYA1HK-222	CAPACITOR	0.0022μF,50V
	C23	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C24	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C25	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C26	NCT06CH-101A	CAPACITOR	100pF,50V
	C27	QCYA1HK-222	CAPACITOR	0.0022μF,50V
	C28	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C30	QEKF1HM-224	E CAPACITOR	0.22μF,50V
	C31	QEKF1HM-474	E CAPACITOR	0.47μF,50V
	C32	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C33	QEPF1VM-225	E CAPACITOR	2.2μF,35V
	C34	QEKF1AM-107	E CAPACITOR	100μF,10V
	C35	NCB31HK-102A	CAPACITOR	0.001μF,50V
	C36	QCYA1HK-153	CAPACITOR	0.015μF,50V
	C37	QEPF1HM-105	E CAPACITOR	1μF,50V
	C38	QEKF1HM-474	E CAPACITOR	0.47μF,50V
	C40	NCB31HK-102A	CAPACITOR	0.001μF,50V
	C41	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C42	NCT06CH-150A	CAPACITOR	15pF,50V
	C43	QCTA1PH-131	CAPACITOR	130pF
	C45	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C46	NCB31HK-102A	CAPACITOR	0.001μF,50V
	C47	NCT06CH-200A	CAPACITOR	20pF,50V
	C48	NCT06CH-180A	CAPACITOR	18pF,50V
	C49	QCYA1HK-103	CAPACITOR	0.01μF,50V
	C50	NCT06CH-121A	CAPACITOR	120pF,50V
	C51	QCTA1CH-680	CAPACITOR	68pF,16V
	C53	NCT06CH-220A	CAPACITOR	22pF,50V
	C55	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C56	QEKF1EM-475	E CAPACITOR	4.7μF,25V
	C57	QCTA1CH-470	CAPACITOR	47pF,16V
	C60	QEKF1CM-476	E CAPACITOR	47μF,16V
	C61	QCT30CH-100	CAPACITOR	10pF,50V
	L1	PU59152-1R0K	COIL	1μH
	L2	PU60025-1R5	COIL	1.5μH

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	L3	PU59152-1R0K	COIL	1µH
	L4	PU60025-1R3	COIL	1.3µH
	L5	PU60997	COIL	
	L7	PU59152-4R7K	COIL	4.7µH
	L8	PU59152-150J	COIL	15µH
	L9	PU59152-220J	COIL	22µH
	L10	PU59152-330J	COIL	33µH
	CF1	PU32990-2	CERAMIC FILTER	
	CF2	PU32990-3	CERAMIC FILTER	
	CF3	PU32990-4	CERAMIC FILTER	
	CF4	PU59039	CERAMIC FILTER	
	CF5	PU59039	CERAMIC FILTER	
	SAW1	PEVB0349	SAW FILTER	
	SAW2	PEVB0350	SAW FILTER	
⚠	X1	PU60086	RESONATOR	
	T1	PU60576	BAND PASS FILTER	
	T2	PELN0347	IF.TRANSFORMER	
	T3	PELN0348	IF.TRANSFORMER	
	T4	PELN0349	IF.TRANSFORMER	
	T5	PU59982-2	IF.TRANSFORMER	
	HD1	PQ21106	HOLDER	
	JP1	PU59935-6	TERMINAL	
	JP2	PU59935-15	TERMINAL	
	SLD1	PU60599	SHIELD PLATE	
	CN3	PU58844-2	CAP HOUSING	

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TUNER CONTROL BOARD ASSEMBLY <08>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB10371A-03	TUNER CONTROL BOARD ASSY	
⚠	TNR1	PERF0046	TUNER	
	IC1	M50253P	IC	
	IC2	MSM16811RS	IC	
	IC3	M5223P	IC	
	IC4	TC4S66F	IC	
	Q1	2SC3936(BC)	TRANSISTOR	
	Q2	2SC3936(BC)	TRANSISTOR	
	Q4	2SC3936(BC)	TRANSISTOR	
	Q5	2SC2636S,T	TRANSISTOR	
	Q6	2SB1219(RS)	TRANSISTOR	
	Q9	2SD1819A(RS)	TRANSISTOR	
	Q10	2SB1068(KU)	TRANSISTOR	
	Q11	DTC144EU	TRANSISTOR	
	Q12	2SC3068	TRANSISTOR	
	Q13	2SB1219(RS)	TRANSISTOR	
	Q14	2SB1219(RS)	TRANSISTOR	
	Q15	2SB1219(RS)	TRANSISTOR	
	Q16	DTA143EU	TRANSISTOR	
	Q18	DTA143EU	TRANSISTOR	
	Q19	DTC114EU	TRANSISTOR	
	Q20	DTC144EU	TRANSISTOR	
	Q21	2SB1219(RS)	TRANSISTOR	
	Q22	DTC114EU	TRANSISTOR	
	Q23	DTC143EU	TRANSISTOR	
	Q24	DTC144EU	TRANSISTOR	
	Q25	DTC144EU	TRANSISTOR	
	Q26	DTC144EU	TRANSISTOR	
	Q27	DTA114EK	TRANSISTOR	
	Q29	DTC114EK	TRANSISTOR	
	Q30	DTA114EK	TRANSISTOR	
	D1	ND487C2-3R	BARRIER DIODE	
	D2	DAN202U	DIODE	
	D4	HZT33-02	ZENER DIODE	
	D7	DAN202U	DIODE	
	D8	DAN202U	DIODE	
	D9	E-822-T2	CR DIODE	
	D11	1SS133	DIODE	
	R1	NRSA63J-750N	RESISTOR	75Ω,1/16W
	R2	NRSA63J-223N	RESISTOR	22kΩ,1/16W
	R3	NRSA63J-153N	RESISTOR	15kΩ,1/16W
	R4	NRSA63J-621N	RESISTOR	620Ω,1/16W
	R5	NRSA63J-221N	RESISTOR	220Ω,1/16W
	R7	NRSA63J-561N	RESISTOR	560Ω,1/16W
	R8	NRSA63J-331N	RESISTOR	330Ω,1/16W
	R12	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R13	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R14	NRSA63J-102N	RESISTOR	1kΩ,1/16W
	R15	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R16	NRSA63J-391N	RESISTOR	390Ω,1/16W
	R17	NRSA63J-562N	RESISTOR	5.6kΩ,1/16W
	R18	QVZ3531-223	V RESISTOR,DBM BALANCE	
	R19	NRSA63J-102N	RESISTOR	1kΩ,1/16W
	R20	QRSA08J-331YN	RESISTOR	330Ω,1/10W
	R21	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R22	NRSA63J-153N	RESISTOR	15kΩ,1/16W
	R23	NRSA63J-153N	RESISTOR	15kΩ,1/16W
	R24	NRSA63J-102N	RESISTOR	1kΩ,1/16W
	R25	NRSA63J-182N	RESISTOR	1.8kΩ,1/16W
	R26	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R27	QRD161J-331	RESISTOR	330Ω,1/6W
	R28	QRD161J-561	RESISTOR	560Ω,1/6W
	R33	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R34	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R35	QRSA08J-333YN	RESISTOR	33kΩ,1/10W
	R36	NRSA63J-394N	RESISTOR	390kΩ,1/16W
	R37	NRSA63J-154N	RESISTOR	150kΩ,1/16W
	R38	NRSA63J-154N	RESISTOR	150kΩ,1/16W
	R39	NRSA63J-154N	RESISTOR	150kΩ,1/16W
	R40	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R41	NRSA63J-152N	RESISTOR	1.5kΩ,1/16W
	R42	NRSA63J-182N	RESISTOR	1.8kΩ,1/16W
	R43	NRSA63J-471N	RESISTOR	470Ω,1/16W
	R45	NRSA63J-472N	RESISTOR	4.7kΩ,1/16W
	R46	NRSA63J-103N	RESISTOR	10kΩ,1/16W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R47	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R48	NRSA63J-222N	RESISTOR	2.2kΩ,1/16W
	R49	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R50	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R51	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R52	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R53	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R54	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R55	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R56	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R57	QRSA08J-153	RESISTOR	15kΩ,1/10W
	R58	NRSA63J-224N	RESISTOR	220kΩ,1/16W
	R60	QRSA08J-224YN	RESISTOR	220kΩ,1/10W
	R61	NRSA63J-104N	RESISTOR	100kΩ,1/16W
	R62	NRSA63J-393N	RESISTOR	39kΩ,1/16W
	R63	NRSA63J-223N	RESISTOR	22kΩ,1/16W
	R65	NRSA63J-473N	RESISTOR	47kΩ,1/16W
	R66	NRSA63J-152N	RESISTOR	1.5kΩ,1/16W
	R67	NRSA63J-182N	RESISTOR	1.8kΩ,1/16W
	R68	NRSA63J-562N	RESISTOR	5.6kΩ,1/16W
	R69	NRSA63J-621N	RESISTOR	620Ω,1/16W
	R70	NRSA63J-621N	RESISTOR	620Ω,1/16W
	R71	QRD161J-682	RESISTOR	6.8kΩ,1/6W
	R72	QRD161J-184	RESISTOR	180kΩ,1/6W
	C1	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C2	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C3	NCT06CH-3R0A	CAPACITOR	3pF,50V
	C4	NCT06CH-3R0A	CAPACITOR	3pF,50V
	C6	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C7	NCT06CH-150A	CAPACITOR	15pF,50V
	C9	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C10	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C11	NCT06CH-100A	CAPACITOR	10pF,50V
	C12	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C13	NCT06CH-101A	CAPACITOR	100pF,50V
	C14	NCT06CH-470A	CAPACITOR	47pF,50V
	C15	QCTA1CH-100	CAPACITOR	10pF,16V
	C16	QCTA1PH-150	CAPACITOR	15pF
	C17	NCT06CH-1R0A	CAPACITOR	1pF,50V
	C21	QEKF1HM-106	E CAPACITOR	10μF,50V
	C22	QCYA1HK-103	CAPACITOR	0.01μF,50V
	C23	QFV71HJ-333	TF CAPACITOR	0.033μF,50V
	C24	QFV71HJ-153	TF CAPACITOR	0.015μF,50V
	C25	QFV81HJ-333	TF CAPACITOR	0.033μF,50V
	C26	QFV71HJ-153	TF CAPACITOR	0.015μF,50V
	C27	QEKF1CM-226	E CAPACITOR	22μF,16V
	C28	NCT06CH-8R0A	CAPACITOR	8pF,50V
	C30	QEKF1CM-226	E CAPACITOR	22μF,16V
	C31	QEKF1HM-474	E CAPACITOR	0.47μF,50V
	C32	QEKF1HM-105	E CAPACITOR	1μF,50V
	C33	QEK41CM-106	E CAPACITOR	10μF,16V
	C34	QEKF1HM-225	E CAPACITOR	2.2μF,50V
	C35	QEKF1CM-106	E CAPACITOR	10μF,16V
	C36	QEK41HM-335	E CAPACITOR	3.3μF,50V
	C37	QEKF1CM-106	E CAPACITOR	10μF,16V
	C40	QCYA1EK-473	CAPACITOR	0.047μF,25V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C50	QFN31HJ-683	M CAPACITOR	0.068μF,50V
	L1	PU59152-1R0K	COIL	1μH
	L2	PU59152-1R0K	COIL	1μH
	L3	PU60583	IF.TRANSFORMER	
	L4	PU60634	COIL	
	L5	PU60635-6	IF.TRANSFORMER	
	T1	PELN0350	IF.TRANSFORMER	
	T2	PU60574	BALUN	
	T3	PU60574	BALUN	
	SLD1	PQ44866	SHILD PLATE	
	SLD2	PQ33535	SHIELD CASE	
	WR1	PW30401-BB19T	COAXIAL CORD	
	CN1	PU58844-13	CAP HOUSING	
	CN2	PU58844-5	CAP HOUSING	
	CN3	PU58844-8	CAP HOUSING	
	CN4	PU58844-2	CAP HOUSING	
	CN5	QMC0131-002	PIN JACK	
⚠	CP1	ICP-F10	CIRCUIT PROTECTOR	

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AUDIO CONTROL HEAD BOARD < 12>

REF. No.	PART No.	PART NAME, DESCRIPTION
PWB1	PB40046-01-02	A/CTL HEAD BOARD
CN1	PU58844-104	CAP HOUSING
CN2	PU58844-103	CAP HOUSING

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TIMER/DISPLAY/SW BOARD ASSEMBLY <21>

REF. No.	PART No.	PART NAME, DESCRIPTION
PWBA	PB10365B	TIMER/DISPLAY/SW BOARD ASSY
IC1	UPD75212ACW-199	IC
IC2	IC-PST523H-2	IC
IC101	GP1U541X	INFRARED RAYS UNIT
or	GP1U521X	INFRARED RAYS UNIT
or	GP1U521	INFRARED RAYS UNIT
Q1	2SC3311A(RS)	TRANSISTOR
or	2SC3199(G)	TRANSISTOR
D1	RD9.1ES-T1B2	ZENER DIODE
D2	11ES2	DIODE
D3	11ES2	DIODE
D4	1SS133	DIODE
D5	1SS133	DIODE
D101	SLH-34VC3F	LE DIODE, NTSC 4.43
D102	SLH-34VC3F	LE DIODE, NTSC 3.58
D103	SLH-34VC3F	LE DIODE, SECAM
D104	SLH-34VC3F	LE DIODE, MESECAM
D105	SLH-34VC3F	LE DIODE, PAL

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	D106	SLH-34MC3F	LE DIODE, A.TRACK	
	D107	SLH-34DC3F	LE DIODE, PAUSE	
	D108	1SS132	DIODE	
	D109	1SS132	DIODE	
	D110	1SS132	DIODE	
	D111	1SS132	DIODE	
	D112	1SS132	DIODE	
	D113	1SS132	DIODE	
	D114	RD10ES-T1B2	ZENER DIODE	
		or UZ10BSB	ZENER DIODE	
	D115	1SS132	DIODE	
	D126	1SS132	DIODE	
	D127	1SS132	DIODE	
	D128	1SS132	DIODE	
	D129	1SS132	DIODE	
	D134	1SS132	DIODE	
	R1	QRD161J-103	RESISTOR	10kΩ,1/6W
	R2	QRD161J-682	RESISTOR	6.8kΩ,1/6W
	R3	QRD161J-333	RESISTOR	33kΩ,1/6W
	R4	QRD161J-333	RESISTOR	33kΩ,1/6W
	R5	QRD161J-102	RESISTOR	1kΩ,1/6W
	R6	QRD161J-103	RESISTOR	10kΩ,1/6W
	R7	QRD161J-103	RESISTOR	10kΩ,1/6W
	R8	QRD161J-103	RESISTOR	10kΩ,1/6W
	R9	QRD161J-103	RESISTOR	10kΩ,1/6W
	R10	QRD161J-271	RESISTOR	270Ω,1/6W
	R11	QRD161J-271	RESISTOR	270Ω,1/6W
	R12	QRD161J-333	RESISTOR	33kΩ,1/6W
	R13	QRD161J-224	RESISTOR	220kΩ,1/6W
	R14	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R15	QRD161J-103	RESISTOR	10kΩ,1/6W
	R16	QRD161J-103	RESISTOR	10kΩ,1/6W
	R17	QRD161J-273	RESISTOR	27kΩ,1/6W
	R18	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R101	QRD161J-271	RESISTOR	270Ω,1/6W
	R102	QRD161J-271	RESISTOR	270Ω,1/6W
	R103	QRD161J-271	RESISTOR	270Ω,1/6W
	R104	QRD161J-271	RESISTOR	270Ω,1/6W
	R105	QRD161J-271	RESISTOR	270Ω,1/6W
	R106	QRD161J-271	RESISTOR	270Ω,1/6W
	R107	QRD161J-271	RESISTOR	270Ω,1/6W
	R108	QRD161J-333	RESISTOR	33kΩ,1/6W
	RA1	QRB047J-333	RESISTOR ARRAY	
		or QRB049J-333	RARRAY	
	C1	QER61CM-106	E CAPACITOR	10μF,16V
	C2	QER61CM-106	E CAPACITOR	10μF,16V
	C3	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C4	QEA40HZ-104	E CAPACITOR (DOUBLE)	0.1μF,5V
		or PU60676-104	E CAPACITOR	0.1μF,5.5V
	C5	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C6	QAT3123-200	TRIMMER CAPACITOR, CLOCK	20pF
	C7	QER61CM-106	E CAPACITOR	10μF,16V
	C8	QCSB1HJ-120	CAPACITOR	12pF,50V
	C9	QCBB1HJ-101	CAPACITOR	100pF,50V
	C10	QCBB1HJ-101	CAPACITOR	100pF,50V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C11	QER61HM-106	E CAPACITOR	10μF,50V
	C12	QER61CM-106	E CAPACITOR	10μF,16V
	C13	QCF11HP-473	CAPACITOR	0.047μF,50V
	C14	QCF31HP-473	CAPACITOR	0.047μF,50V
⚠	X1	PU60226-4	CRYSTAL RESONATOR	
	S2	PU60392-2Z	TACT SWITCH,STOP/EJECT	
	S3	PU60392-2Z	TACT SWITCH,FF	
	S4	PU60392-2Z	TACT SWITCH,REW	
	S5	PU60392-2Z	TACT SWITCH,TV/VIDEO	
	S6	PU60392-2Z	TACT SWITCH,REC/ITR	
	S7	PU60392-2Z	TACT SWITCH,PLAY	
	S8	PU60392-2Z	TACT SWITCH,PAUSE/STOLL	
	S18	PU60392-2Z	TACT SWITCH,PROGRAM/CLOCK ADJ	
	S19	PU60392-2Z	TACT SWITCH,START	
	S21	PU60392-2Z	TACT SWITCH,CANCEL/SKIP/RESET	
	S22	PU60392-2Z	TACT SWITCH,REPEAT/STORE	
	S23	PU60392-2Z	TACT SWITCH,SELECT	
	S24	PU60392-2Z	TACT SWITCH,TIMER	
	S25	PU60392-2Z	TACT SWITCH,SET(+)/TRACK(+)	
	S26	PU60392-2Z	TACT SWITCH,SET(−)/TRACK(−)	
	S30	PU60392-2Z	TACT SWITCH,CH/SET	
	S49	PU60392-2Z	TACT SWITCH,CH(+)	
	S50	PU60392-2Z	TACT SWITCH,CH(−)	
	S101	PU58486-1-1	SLIDE SWITCH, SECAM/MESECAM	
	S102	PU58487-1-1	SLIDE SWITCH, NTSC/PAL/SECAM	
	S103	PU58486-1-1	SLIDE SWITCH,NTSC3.58/NTSC4.43	
	FDP1	PEDP0010	FLUORESCENT DISPLAY PANEL	
	HD1	PQ31355-1-2	FDP HOLDER(R)	
	HD2	PQ31356-1-2	FDP HOLDER(L)	
	HD3	PQM30038-1-2	LED HOLDER	
	TP1	PU56278	TEST POINT	
	CN1	PU59555-8	CAP HOUSING	
	CN2	PU58844-9	CAP HOUSING	
	CN3	PU58844-4	CAP HOUSING	
⚠	CP1	ICP-F10	CIRCUIT PROTECTOR	

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OPERATION BOARD ASSEMBLY <22>

PWBA	PB20443B	OPERATION BOARD ASSY	
D1	SLH-34VC3F	LE DIODE, POWER	
D2	1SS132	DIODE	
D3	1SS132	DIODE	
D4	1SS132	DIODE	
R1	PU61127	V RESISTOR, PICTURE SHARP	
R2	QRD167J-271	RESISTOR	270Ω, 1/6W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	S1	PU53598-2	TACT SWITCH,POWER	
	S2	PU58486-1-1	SLIDE SWITCH,SP/LP(EP)	
	S3	PU58486-1-1	SLIDE SWITCH,AUTO MANUAL	
	S4	PU58486-1-1	SLIDE SWITCH,AFC	
	CL1	PU59311	WIRE CLAMP	
	HD1	PQM30038-1-2	LED HOLDER	
	CN1	PU59513-9	CAP HOUSING	

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UPPER DRUM BOARD <41>

REF. No.	PART No.	PART NAME, DESCRIPTION
PWB1	PDM3017	BOARD (UPPER DRUM)

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PRE/REC AMP BOARD ASSEMBLY <43>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB10434A	PRE/REC BOARD ASSY	
	IC1	AN3386NK-A	IC	
	Q1	2SA1576(QRS)	TRANSISTOR	
	Q2	2SC4081(QRS)	TRANSISTOR	
	Q3	DTA124EU	TRANSISTOR	
	Q4	2SC4081(QRS)	TRANSISTOR	
	Q5	2SC4081(QRS)	TRANSISTOR	
	Q6	2SC4081(QRS)	TRANSISTOR	
	Q7	2SA1576(QRS)	TRANSISTOR	
	Q8	DTC144WU	TRANSISTOR	
	Q9	DTC144WU	TRANSISTOR	
	Q10	DTC144WU	TRANSISTOR	
	D1	1SS133	DIODE	
		or MA165	DIODE	
	D2	MA141WK	DIODE	
	D3	MA141WA	DIODE	
	D4	1SS133	DIODE	
		or MA165	DIODE	
	R1	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R2	QRSA08J-222	RESISTOR	2.2kΩ,1/10W
	R3	QRSA08J-222	RESISTOR	2.2kΩ,1/10W
	R4	QRSA08J-391YN	RESISTOR	390Ω,1/10W
	R5	QRSA08J-391YN	RESISTOR	390Ω,1/10W
	R6	QRSA08J-821YN	RESISTOR	820Ω,1/10W
	R7	QRSA08J-222	RESISTOR	2.2kΩ,1/10W
	R8	QRSA08J-222	RESISTOR	2.2kΩ,1/10W
	R9	QRSA08J-821YN	RESISTOR	820Ω,1/10W
	R10	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R11	QRSA08J-122YN	RESISTOR	1.2kΩ,1/10W
	R12	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R13	QRSA08J-561YN	RESISTOR	560Ω,1/10W
	R14	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R15	QRSA08J-223YN	RESISTOR	22kΩ,1/10W
	R16	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R17	QRSA08J-153	RESISTOR	15kΩ,1/10W
	R18	QRSA08J-123YN	RESISTOR	12kΩ,1/10W
	R19	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R20	QRSA08J-182Y	RESISTOR	1.8kΩ,1/10W
	R21	QRSA08J-511YN	RESISTOR	510Ω,1/10W
	R22	QRSA08J-681YN	RESISTOR	680Ω,1/10W
	R23	QRSA08J-561YN	RESISTOR	560Ω,1/10W
	R24	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R25	QRSA08J-222	RESISTOR	2.2kΩ,1/10W
	R26	QRSA08J-821YN	RESISTOR	820Ω,1/10W
	R27	QRSA08J-391YN	RESISTOR	390Ω,1/10W
	R28	QRSA08J-391YN	RESISTOR	390Ω,1/10W
	R29	QRSA08J-222	RESISTOR	2.2kΩ,1/10W
	R30	QRSA08J-222	RESISTOR	2.2kΩ,1/10W
	R31	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R32	QRSA08J-104	RESISTOR	100kΩ,1/10W
	R33	QRSA08J-153	RESISTOR	15kΩ,1/10W
	R34	QRSA08J-334YN	RESISTOR	330kΩ,1/10W
	R36	QRSA08J-393YN	RESISTOR	39kΩ,1/10W
	R37	QRSA08J-153	RESISTOR	15kΩ,1/10W
	R38	QRSA08J-224YN	RESISTOR	220kΩ,1/10W
	R39	QRD161J-433	RESISTOR	43kΩ,1/6W
	R40	QRS188J-474YN	RESISTOR	470kΩ,1/8W
	R41	QRSA08J-241YN	RESISTOR	240Ω,1/10W
	R42	QRSA08J-331YN	RESISTOR	330Ω,1/10W
	R43	QRSA08J-271YN	RESISTOR	270Ω,1/10W
	R44	QRSA08J-271YN	RESISTOR	270Ω,1/10W
	R45	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R46	QRS188J-562YN	RESISTOR	5.6kΩ,1/8W
	R47	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	C1	QCSA1HJ-681	CAPACITOR	680pF,50V
	C2	QCSA1HJ-150	CAPACITOR	15pF,50V
	C3	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C4	QCSA1HJ-200	CAPACITOR	20pF,50V
	C5	QCSA1HJ-100	CAPACITOR	10pF,50V
	C6	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C7	QCSA1HJ-680	CAPACITOR	68pF,50V
	C8	QCSA1HJ-9R0	CAPACITOR	9pF,50V
	C9	QCSA1HJ-240	CAPACITOR	24pF,50V
	C10	QCSA1HJ-301	CAPACITOR	300pF,50V
	C11	QCSA1HJ-181	CAPACITOR	180pF,50V
	C12	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C13	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C14	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C15	QCSA1HJ-331	CAPACITOR	330pF,50V
	C16	QCSA1HJ-121	CAPACITOR	120pF,50V
	C17	QCSA1HJ-470	CAPACITOR	47pF,50V
	C18	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C19	QCSA1HJ-330	CAPACITOR	33pF,50V
	C20	QCSA1HJ-360	CAPACITOR	36pF,50V
	C22	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C23	QCSA1HJ-100	CAPACITOR	10pF,50V
	C24	QCSA1HJ-471	CAPACITOR	470pF,50V
	C25	QER60JM-476	E CAPACITOR	47μF,6.3V
	C26	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C27	QCSA1HJ-680	CAPACITOR	68pF,50V
	C28	QCF81EZ-104	CAPACITOR	0.1μF,25V
	C29	QCF81HZ-103	CAPACITOR	0.01μF,50V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C30	QCSA1HJ-391	CAPACITOR	390pF,50V
	C31	QCFA1EZ-683	CAPACITOR	0.068μF,25V
	C32	QER60JM-107	E CAPACITOR	100μF,6.3V
	C34	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C35	QCFA1EZ-104	CAPACITOR	0.1μF,25V
	C36	QCY81EK-104	CAPACITOR	0.1μF,25V
	C37	QCSA1HJ-101	CAPACITOR	100pF,50V
	C38	QCSA1HJ-151	CAPACITOR	150pF,50V
	C39	QCY81EK-104	CAPACITOR	0.1μF,25V
	C40	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C41	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C42	QCY81EK-104	CAPACITOR	0.1μF,25V
	C43	QCSA1HJ-101	CAPACITOR	100pF,50V
	C44	QCSA1HJ-101	CAPACITOR	100pF,50V
	C45	QCF81EZ-104	CAPACITOR	0.1μF,25V
	C46	QER61AM-685	E CAPACITOR	6.8μF,10V
	C47	QCF81EZ-224	CAPACITOR	0.22μF,25V
	C48	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C51	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	L1	PU48530-101K	COIL	100μH
	L2	PU59152-560J	COIL	56μH
	L3	PU59152-220J	COIL	22μH
	L4	PU59152-560J	COIL	56μH
	L5	PU59152-470J	COIL	47μH
	L6	PU59152-330J	COIL	33μH
	L7	PU59152-121J	COIL	120μH
	L8	PU59152-181J	COIL	180μH
	L9	PU59152-100J	COIL	10μH
	L10	PU59152-180J	COIL	18μH
	L11	PU59152-560J	COIL	56μH
	L12	PU59152-330J	COIL	33μH
	L13	PU59152-330J	COIL	33μH
	L14	PU48530-101K	COIL	100μH
	SLD1	PQ32216-1-1	SHIELD CASE(1)	
	CN1	PU58844-106	CAP HOUSING	
	CN2	PU59555-107	CAP HOUSING	
	CN3	PU59555-104	CAP HOUSING	
	CN4	PU59974-8	CAP HOUSING	

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SERVO BOARD ASSEMBLY <48>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB20431B-01	SERVO BOARD ASSY	
	IC401	HD49733ANT	IC	
	IC501	BA7039	IC	
	or	XRA7039	IC	
	Q401	DTA124ES	TRANSISTOR	
	D401	1SS133	DIODE	
	or	MA165	DIODE	
	D402	1SS133	DIODE	
	or	MA165	DIODE	
	D403	1SS133	DIODE	
	or	MA165	DIODE	
	D404	1SS133	DIODE	
	or	MA165	DIODE	
	D405	1SS133	DIODE	
	or	MA165	DIODE	
	D406	1SS133	DIODE	
	or	MA165	DIODE	
	D407	1SS133	DIODE	
	or	MA165	DIODE	
	D408	1SS133	DIODE	
	or	MA165	DIODE	
	D409	1SS133	DIODE	
	or	MA165	DIODE	
	D410	1SS133	DIODE	
	or	MA165	DIODE	
	R401	QRD161J-223	RESISTOR	22kΩ,1/6W
	R402	QRD161J-225	RESISTOR	2.2MΩ,1/6W
	R403	QRD161J-683	RESISTOR	68kΩ,1/6W
	R404	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R405	QRD161J-123	RESISTOR	12kΩ,1/6W
	R406	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R407	QRD161J-392	RESISTOR	3.9kΩ,1/6W
	R408	QRD161J-105	RESISTOR	1MΩ,1/6W
	R409	QRD161J-273	RESISTOR	27kΩ,1/6W
	R410	QRD161J-105	RESISTOR	1MΩ,1/6W
	R411	QRD161J-105	RESISTOR	1MΩ,1/6W
	R412	QRD161J-273	RESISTOR	27kΩ,1/6W
	R413	QRD161J-273	RESISTOR	27kΩ,1/6W
	R414	QRD161J-335	RESISTOR	3.3MΩ,1/6W
	R415	QRD161J-334	RESISTOR	330kΩ,1/6W
	R416	QRD161J-822	RESISTOR	8.2kΩ,1/6W
	R417	QRD161J-332	RESISTOR	3.3kΩ,1/6W
	R418	QRD161J-102	RESISTOR	1kΩ,1/6W
	R419	QRD161J-473	RESISTOR	47kΩ,1/6W
	R420	QVZ3518-474	V RESISTOR,NTSC SW POINT	
	R421	QVZ3518-684	V RESISTOR,PAL SW POINT	
	R422	QRD161J-104	RESISTOR	100kΩ,1/6W
	R426	QRD161J-821	RESISTOR	820Ω,1/6W
	R427	QRD161J-102	RESISTOR	1kΩ,1/6W
	R428	QRD161J-105	RESISTOR	1MΩ,1/6W
	R429	QRD161J-102	RESISTOR	1kΩ,1/6W
	R430	QRD161J-102	RESISTOR	1kΩ,1/6W
	R434	QRD161J-102	RESISTOR	1kΩ,1/6W
	R435	QRD161J-102	RESISTOR	1kΩ,1/6W
	R436	QRD161J-274	RESISTOR	270kΩ,1/6W
	R437	QRD161J-274	RESISTOR	270kΩ,1/6W
	R438	QRD161J-224	RESISTOR	220kΩ,1/6W
	R439	QRD161J-103	RESISTOR	10kΩ,1/6W
	R501	QRD161J-102	RESISTOR	1kΩ,1/6W
	R502	QRD161J-332	RESISTOR	3.3kΩ,1/6W
	R503	QRD161J-682	RESISTOR	6.8kΩ,1/6W
	R508	QRD161J-124	RESISTOR	120kΩ,1/6W
	C401	QCVB1CM-103	CAPACITOR	0.01μF,16V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C402	QEK61AM-226	E CAPACITOR	22μF,10V
	C403	QFV11HJ-224	TF CAPACITOR	0.22μF,50V
	or	QFV71HJ-224	TF CAPACITOR	0.22μF,50V
	C404	QCC31CK-682	CAPACITOR	0.0068μF,16V
	C405	QEK61EM-475	E CAPACITOR	4.7μF,25V
	C406	QEK61EM-475	E CAPACITOR	4.7μF,25V
	C407	QEK61CM-106	E CAPACITOR	10μF,16V
	C408	QEK61CM-106	E CAPACITOR	10μF,16V
	C409	QCC31CK-223	CAPACITOR	0.022μF,16V
	C410	QFV71HJ-184	TF CAPACITOR	0.18μF,50V
	or	QFV11HJ-184	MMT CAP	0.18μF,50V
	C411	QCBB1HJ-471	CAPACITOR	470pF,50V
	C412	QFL31HJ-682	M CAPACITOR	0.0068μF,50V
	C414	QCBB1HJ-102	CAPACITOR	0.001μF,50V
	C415	QEK61AM-226	E CAPACITOR	22μF,10V
	C416	QEK61AM-226	E CAPACITOR	22μF,10V
	C417	QCBB1HJ-271	CAPACITOR	270pF,50V
	C418	QCBB1HJ-561	CAPACITOR	560pF,50V
	C419	QCBB1HJ-102	CAPACITOR	0.001μF,50V
	C420	QEK61HM-105	E CAPACITOR	1μF,50V
	C421	QCBB1HJ-102	CAPACITOR	0.001μF,50V
	C422	QFV71HJ-563	TF CAPACITOR	0.056μF,50V
	or	QFV11HJ-563	MMT CAP	
	C423	QCBB1HJ-102	CAPACITOR	0.001μF,50V
	C427	QCBB1HJ-181	CAPACITOR	180pF,50V
	C502	QCVB1CM-103	CAPACITOR	0.01μF,16V
	C504	QFV71HJ-104	TF CAPACITOR	0.1μF,50V
	or	QFV11HJ-104	MM CAPACITOR	0.1μF,50V
	C505	QCVB1CM-103	CAPACITOR	0.01μF,16V
	C506	QFV71HJ-683	TF CAPACITOR	0.068μF,50V
	or	QFV11HJ-683	MMT CAP	0.068μF,50V
	C507	QCVB1CM-103	CAPACITOR	0.01μF,16V
	C508	QEK61AM-226	E CAPACITOR	22μF,10V
	C509	QCVB1CM-103	CAPACITOR	0.01μF,16V
	L501	PU59152-270J	COIL	27μH
	HN1	PU58018-1-2	PWB HINGE	
	TP401	PU57545	TEST PIN, X5	
	CN401	PU58844-2	CAP HOUSING	
	CN402	PU58844-8	CAP HOUSING	
	CN403	PU59934-8	WIRE HOLDER	
	CN404	PU59555-4	CAP HOUSING	
	CN405	PU58844-3	CAP HOUSING	
	CN406	PU59934-12	WIRE HOLDER	
⚠	CP401	ICP-F15	CIRCUIT PROTECTOR	

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DECK TERMINAL BOARD ASSEMBLY <51>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB10141C-02	DECK TERMINAL BOARD ASSY	
	Q1	PU60625	END SENSOR	
	R1	QRD161J-102	RESISTOR	1kΩ,1/6W
	R2	QRD161J-123	RESISTOR	12kΩ,1/6W
	R3	QRD161J-331	RESISTOR	330Ω,1/6W
	R4	QRD161J-331	RESISTOR	330Ω,1/6W
	C1	QCVB1CM-103	CAPACITOR	0.01μF,16V
	C2	QCFB1EZ-223	CAPACITOR	0.022μF,25V
	PHS1	PU60623	REEL SENSOR, (PS1)	
	or	PS5705HR	PH INTERRUPTER	
	CN1	PEMC0722-014	WIRE TRAP	
	or	PEMC0753-014	WIRE TRAP	
	CN2	PU60642	CONNECTOR	
	CN3	PU60640	CONNECTOR	

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LOADING MDA BOARD ASSEMBLY <55>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA2	PB10141C2-02	LOADING MDA BOARD ASSY	
⚠	IC1	BA6418N	IC	
⚠	or	XRA6418N	IC	
	C1	QETC1CM-476	E CAPACITOR	47μF,16V
	C3	QFN31HJ-223	M CAPACITOR	0.022μF,50V
	CN1	PU59555-104	CAP HOUSING	
	CN2	PU58844-102	CAP HOUSING	

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CASSETTE HOUSING BOARD <56>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWB1	PB40041-01-01	CASSETTE HOUSING BOARD	
	Q2	PN268VI-NC	PHOTO TRANSISTOR	
	C1	QCC11EJ-103	CAPACITOR	0.01μF,25V
	PHS3	PU60629	CASS.SENSOR,(PS3)	
	CN2	PU60639	4 PIN SOCKET	

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SIF BOARD ASSEMBLY <95>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB10373A-02	SIF BOARD ASSY	
	IC1	LA7710	IC	
	IC3	LA1150N	IC	
	IC4	LM339N	IC	
	IC5	TA8721SN	IC	
	IC6	M5223P	IC	
	IC7	LA7016	IC	
	Q1	2SA1532(BC)	TRANSISTOR	
	Q2	2SC3354	TRANSISTOR	
	Q3	DTC114EU	TRANSISTOR	
	Q4	2SC3354	TRANSISTOR	

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	Q5	DTC123EU	TRANSISTOR	
	Q6	DTC144EU	TRANSISTOR	
	Q7	2SD1819A(RS)	TRANSISTOR	
	Q8	2SD1819A(RS)	TRANSISTOR	
	Q9	2SD1819A(RS)	TRANSISTOR	
	Q10	2SK381(C)	FE TRANSISTOR	
	Q11	DTC114EU	TRANSISTOR	
	Q12	2SD1819A(RS)	TRANSISTOR	
	Q13	2SD1819A(RS)	TRANSISTOR	
	Q14	2SD1819A(RS)	TRANSISTOR	
	Q15	DTC114EU	TRANSISTOR	
	Q16	DTC114EU	TRANSISTOR	
	Q17	DTC114EU	TRANSISTOR	
	Q18	2SD1450S,T	TRANSISTOR	
	Q19	2SD1863(QR)	TRANSISTOR	
	D2	1SS133	DIODE	
	D3	HZT33-02	ZENER DIODE	
	D4	E-452-2	DIODE	
	D5	1SV136	DIODE	
	D6	1SS152	DIODE	
	D7	1SS133	DIODE	
	D8	1SS133	DIODE	
	D9	1SS133	DIODE	
	D10	1SS133	DIODE	
	D11	SVC321SPA-B-1	V.DIODE	
	D12	RD10ES-T1B1	ZENER DIODE	
	R1	NRSA63J-562N	RESISTOR	5.6kΩ,1/16W
	R2	NRSA63J-821N	RESISTOR	820Ω,1/16W
	R3	QRSA08J-222	RESISTOR	2.2kΩ,1/10W
	R4	NRSA63J-102N	RESISTOR	1kΩ,1/16W
	R5	QRSA08J-271YN	RESISTOR	270Ω,1/10W
	R6	NRSA63J-271N	RESISTOR	270Ω,1/16W
	R7	NRSA63J-101N	RESISTOR	100Ω,1/16W
	R8	QRD161J-470	RESISTOR	47Ω,1/6W
	R9	NRSA63J-821N	RESISTOR	820Ω,1/16W
	R10	QRSA08J-271YN	RESISTOR	270Ω,1/10W
	R11	QRSA08J-271YN	RESISTOR	270Ω,1/10W
	R12	NRSA63J-101N	RESISTOR	100Ω,1/16W
	R13	QRD161J-474	RESISTOR	470kΩ,1/6W
	R14	NRSA63J-470N	RESISTOR	47Ω,1/16W
	R16	QVZ3518-472	V RESISTOR, SECAM AUDIO LEVEL	
	R17	NRSA63J-331N	RESISTOR	330Ω,1/16W
	R18	NRSA63J-750N	RESISTOR	75Ω,1/16W
	R19	QRSA08J-682	RESISTOR	6.8kΩ,1/10W
	R20	NRSA63J-391N	RESISTOR	390Ω,1/16W
	R21	QRSA08J-822YN	RESISTOR	8.2kΩ,1/10W
	R22	NRSA63J-473N	RESISTOR	47kΩ,1/16W
	R23	QRSA08J-473	RESISTOR	47kΩ,1/10W
	R24	NRSA63J-274N	RESISTOR	270kΩ,1/16W
	R25	NRSA63J-473N	RESISTOR	47kΩ,1/16W
	R26	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R27	QVZ3518-333	V RESISTOR, SECAM S LLD	
	R29	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R30	QRSA08J-221YN	RESISTOR	220Ω,1/10W
	R31	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R32	NRSA63J-103N	RESISTOR	10kΩ,1/16W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R33	NRSA63J-221N	RESISTOR	220Ω,1/16W
	R34	NRSA63J-332N	RESISTOR	3.3kΩ,1/16W
	R35	NRSA63J-332N	RESISTOR	3.3kΩ,1/16W
	R36	NRSA63J-562N	RESISTOR	5.6kΩ,1/16W
	R37	NRSA63J-471N	RESISTOR	470Ω,1/16W
	R38	NRSA63J-102N	RESISTOR	1kΩ,1/16W
	R39	NRSA63J-105N	RESISTOR	1MΩ,1/16W
	R40	QRSA08J-470YN	RESISTOR	47Ω,1/10W
	R41	NRSA63J-102N	RESISTOR	1kΩ,1/16W
	R42	NRSA63J-161N	RESISTOR	160Ω,1/16W
	R43	QRSA08J-682	RESISTOR	6.8kΩ,1/10W
	R44	NRSA63J-222N	RESISTOR	2.2kΩ,1/16W
	R45	QRSA08J-561YN	RESISTOR	560Ω,1/10W
	R46	NRSA63J-221N	RESISTOR	220Ω,1/16W
	R47	NRSA63J-102N	RESISTOR	1kΩ,1/16W
	R48	NRSA63J-333N	RESISTOR	33kΩ,1/16W
	R49	NRSA63J-223N	RESISTOR	22kΩ,1/16W
	R50	NRSA63J-102N	RESISTOR	1kΩ,1/16W
	R51	NRSA63J-471N	RESISTOR	470Ω,1/16W
	R52	QRSA08J-104	RESISTOR	100kΩ,1/10W
	R53	NRSA63J-104N	RESISTOR	100kΩ,1/16W
	R54	NRSA63J-472N	RESISTOR	4.7kΩ,1/16W
	R55	NRSA63J-182N	RESISTOR	1.8kΩ,1/16W
	R56	NRSA63J-562N	RESISTOR	5.6kΩ,1/16W
	R57	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R58	NRSA63J-224N	RESISTOR	220kΩ,1/16W
	R59	NRSA63J-223N	RESISTOR	22kΩ,1/16W
	R60	NRSA63J-472N	RESISTOR	4.7kΩ,1/16W
	R61	NRSA63J-472N	RESISTOR	4.7kΩ,1/16W
	R62	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R63	NRSA63J-224N	RESISTOR	220kΩ,1/16W
	R64	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R65	NRSA63J-472N	RESISTOR	4.7kΩ,1/16W
	R66	NRSA63J-472N	RESISTOR	4.7kΩ,1/16W
	R67	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R68	NRSA63J-224N	RESISTOR	220kΩ,1/16W
	R69	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R70	NRSA63J-224N	RESISTOR	220kΩ,1/16W
	R71	NRSA63J-472N	RESISTOR	4.7kΩ,1/16W
	R72	NRSA63J-472N	RESISTOR	4.7kΩ,1/16W
	R73	NRSA63J-471N	RESISTOR	470Ω,1/16W
	R74	NRSA63J-471N	RESISTOR	470Ω,1/16W
	R75	NRSA63J-471N	RESISTOR	470Ω,1/16W
	R76	NRSA63J-223N	RESISTOR	22kΩ,1/16W
	R77	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R78	NRSA63J-682N	RESISTOR	6.8kΩ,1/16W
	R80	NRSA63J-621N	RESISTOR	620Ω,1/16W
	R81	NRSA63J-621N	RESISTOR	620Ω,1/16W
	R82	NRSA63J-474N	RESISTOR	470kΩ,1/16W
	R83	NRSA63J-471N	RESISTOR	470Ω,1/16W
	R84	NRSA63J-681N	RESISTOR	680Ω,1/16W
	R85	QVZ3518-682	V RESISTOR, NTSC AUDIO LEVEL	
	R86	QVZ3518-682	V RESISTOR, PAL AUDIO LEVEL	
	R87	NRSA63J-474N	RESISTOR	470kΩ,1/16W
	R88	NRSA63J-104N	RESISTOR	100kΩ,1/16W
	R89	NRSA63J-104N	RESISTOR	100kΩ,1/16W
	R90	NRSA63J-473N	RESISTOR	47kΩ,1/16W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R91	NRSA63J-163N	RESISTOR	16kΩ,1/16W
	R92	NRSA63J-104N	RESISTOR	100kΩ,1/16W
	R93	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R94	NRSA63J-104N	RESISTOR	100kΩ,1/16W
	R95	NRSA63J-104N	RESISTOR	100kΩ,1/16W
	R96	QRSA08J-123YN	RESISTOR	12kΩ,1/10W
	R97	NRSA63J-822N	RESISTOR	8.2kΩ,1/16W
	R98	NRSA63J-223N	RESISTOR	22kΩ,1/16W
	R99	NRSA63J-752N	RESISTOR	7.5kΩ,1/16W
	R101	QRSA08J-152	RESISTOR	1.5kΩ,1/10W
	R102	NRSA63J-471N	RESISTOR	470Ω,1/16W
	R103	QRSA08J-101YN	RESISTOR	100Ω,1/10W
	R105	QRD161J-331	RESISTOR	330Ω,1/6W
	R106	NRSA63J-473N	RESISTOR	47kΩ,1/16W
	R107	NRSA63J-473N	RESISTOR	47kΩ,1/16W
	R110	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R111	NRSA63J-333N	RESISTOR	33kΩ,1/16W
	R112	NRSA63J-333N	RESISTOR	33kΩ,1/16W
	R113	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	C1	QCBB1HK-102	CAPACITOR	0.001μF,50V
	C2	QCYA1HK-222	CAPACITOR	0.0022μF,50V
	C3	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C4	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C5	QCYA1HK-222	CAPACITOR	0.0022μF,50V
	C7	QCYA1HK-222	CAPACITOR	0.0022μF,50V
	C8	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C9	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C10	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C11	QCYA1HK-222	CAPACITOR	0.0022μF,50V
	C12	QCYA1HK-222	CAPACITOR	0.0022μF,50V
	C15	QEKF1CM-106	E CAPACITOR	10μF,16V
	C16	QEKF1CM-106	E CAPACITOR	10μF,16V
	C17	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C19	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C20	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C21	QCTA1CH-150	CAPACITOR	15pF,16V
	C22	QCYA1HK-222	CAPACITOR	0.0022μF,50V
	C23	QCYA1HK-332	CAPACITOR	0.0033μF,50V
	C24	QEKF1HM-106	E CAPACITOR	10μF,50V
	C25	QCYA1HK-222	CAPACITOR	0.0022μF,50V
	C26	QCYA1HK-222	CAPACITOR	0.0022μF,50V
	C27	QEPF1HM-105	E CAPACITOR	1μF,50V
	C28	QCYA1HK-123	CAPACITOR	0.012μF,50V
	C30	QCYA1HK-222	CAPACITOR	0.0022μF,50V
	C31	PU57601-105KE	E CAPACITOR	1μF,25V
	C32	QEKF1AM-476	E CAPACITOR	47μF,10V
	C33	QEKF1CM-106	E CAPACITOR	10μF,16V
	C34	QCYA1HK-222	CAPACITOR	0.0022μF,50V
	C35	NCT06CH-101A	CAPACITOR	100pF,50V
	C36	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C37	NCT06CH-101A	CAPACITOR	100pF,50V
	C38	NCT06CH-5R0A	CAPACITOR	5pF,50V
	C39	NCS31HJ-471A	CAPACITOR	470pF,50V
	C40	QCYA1HK-103	CAPACITOR	0.01μF,50V
	C41	QCYA1HK-103	CAPACITOR	0.01μF,50V
	C42	NCF31HZ-103A	CAPACITOR	0.01μF,50V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C43	NCT06CH-100A	CAPACITOR	10pF,50V
	C44	QCYA1HK-103	CAPACITOR	0.01μF,50V
	C45	QEKF1HM-105	E CAPACITOR	1μF,50V
	C46	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C47	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C48	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C49	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C50	QCYA1EK-473	CAPACITOR	0.047μF,25V
	C51	QCYA1EK-473	CAPACITOR	0.047μF,25V
	C52	QFN31HJ-822	M CAPACITOR	0.0082μF,50V
	C53	NCT06CH-220A	CAPACITOR	22pF,50V
	C54	QEKF1CM-106	E CAPACITOR	10μF,16V
	C55	QEKF1CM-106	E CAPACITOR	10μF,16V
	C56	QCTA1CH-8R0	CAPACITOR	8pF,16V
	C57	QCYA1HK-103	CAPACITOR	0.01μF,50V
	C58	QCTA1CH-121	CAPACITOR	120pF,16V
	C59	NCT06CH-100A	CAPACITOR	10pF,50V
	C60	QEKF1HM-334	E CAPACITOR	0.33μF,50V
	C61	QEKF1HM-105	E CAPACITOR	1μF,50V
	C62	QEKF1HM-335	E CAPACITOR	3.3μF,50V
	C63	QFN31HJ-472	M CAPACITOR	0.0047μF,50V
	C64	QEKF1CM-106	E CAPACITOR	10μF,16V
	C65	QCYA1HK-103	CAPACITOR	0.01μF,50V
	C66	QEKF1CM-226	E CAPACITOR	22μF,16V
	C67	QCYA1EK-473	CAPACITOR	0.047μF,25V
	C68	QCYA1EK-473	CAPACITOR	0.047μF,25V
	C69	QEKF1CM-106	E CAPACITOR	10μF,16V
	C70	QEKF1CM-106	E CAPACITOR	10μF,16V
	C72	QEKF1CM-336	E CAPACITOR	33μF,16V
	C73	QEKF1CM-476	E CAPACITOR	47μF,16V
	C74	QCS11HJ-100	CAPACITOR	10pF,50V
	L1	PU60025-2R0	COIL	2.0μH
	L2	PU59152-1R0K	COIL	1μH
	L3	PU60025-1R8	COIL	1.8μH
	L4	PU60025-2R0	COIL	2.0μH
	L5	PU59152-1R0K	COIL	1μH
	L6	PU59243	FH TRAP	
	L7	PU59152-6R8J	COIL	6.8μH
	L8	PU59152-100J	COIL	10μH
	L9	PU59152-100J	COIL	10μH
	L10	PU60025-1R8	COIL	1.8μH
	CF1	PEVB0339	C TRAP	
	CF2	PU58558-3	CERAMIC FILTER	
		or PU60774-3	CERAMIC FILTER	
	CF3	PU58558-2	CERAMIC FILTER	
		or PU60774-2	CERAMIC FILTER	
	CF4	PU58558-4	CERAMIC FILTER	
		or PU60774-4	CERAMIC FILTER	
	CF5	PU58558	CERAMIC FILTER	
		or PU60774	CERAMIC FILTER	
	CF6	PEVB0348	C DISCRIMINATER	
	SAW1	PU60954	SAW FILTER	
	SAW2	PU35976	SAW FILTER	
	T1	PELN0346	IF.TRANSFORMER	
	T2	PU61032	BAND PASS FILTER	
	T3	PU61033	DET COIL	

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	T4	PU61110	COIL
	WR1	PW30401-BB09T	COAXIAL CORD
	CN1	PU58844-8	CAP HOUSING
	CN2	PU58844-2	CAP HOUSING
	CN3	PU58844-2	CAP HOUSING
	CN4	QMC0131-002	PIN JACK

SECTION 6
TECHNICAL INFORMATIONS

6.1 CIRCUIT CONTROL SYSTEM

1. IC601 pin function (Mechacon)

Pin No.	Symbol	I/O format	Label	I/O	Contents
1	Port 6 3	C-MOS	LCM 1	O	LOADING MOTOR DRIVER
2	2		LCM 2		
3	1		DRUM DRIVE	O	SPECIAL PB H CORRECTION
4	0		CAP CTL DRIVE		CAPSTAN MOTOR DRIVE VOLTAGE SERVO
5	Port 4 7	N-ch OPEN DRAIN	AVG FM	I	AUTO TRACKING DATA
6	6		S CURVE		TUNING CHECK DATA IN
7	5		THERM		TEMPERATURE COMPENSATION (CAPSTAN BRAKE TIMING CONTROL)
8	4		REC SAFE		REC SAFETY SW ON; L
9	Port 3 7		MODE SENS B	I	MECHANISM MODE DETECTION
10	6		TIMER CLOCK	I	TM (TIMER/MECHACON) BUS CLOCK
11	5		TIMER DATA	I/O	16 bit SERIAL DATA
12	4		MODE SENS A	I	MECHANISM MODE DETECTION
13	3		V SYNC	I	INPUT SIGNAL DETECT (50/60 Hz)
14	2		SERVO	O	CAPSTAN MOTOR SERVO MODE
15	1		CAP FG	I	MODE DETECT, BACK SPACE COUNT
16	0		CTL PULSE	I	MODE DETECT
17	Port 5 7	C-MOS	BT	O	TUNING DATA OUTPUT (PWM DATA)
18	6		PAUSE	O	CAPSTAN MOTOR SERVO
19	5		A/M/S		HEAD SELECT (Auto/Manual/Slow)
20	4		V PULSE		V PULSE OUTPUT
21	P5 3/T/ED3	—	DRUM FF	I	DRUM FF (REC TIMING CONTROL)
22	CN Vss	—	Vss	I	GND
23	RESET		RESET		RESET AT CONNECT VCR TO AC
24	X IN		X IN	I	SYSTEM CLOCK (8 MHz)
25	X OUT		X OUT	O	
26	Vee		Vss	—	GND
27	Port 5 2	—	TU FG	I	TAKE UP REEL ROTATION DETECT
28	1		V SYNC	I	SIGNAL DETECT
29	0		START SENS	I	START SENSOR (LEADER TAPE DETECT, SENS ON;L)
30	Port 1 5	N-ch OPEN DRAIN	CASS SENS	I	CASSETTE SENSOR (CASSETTE IN/OUT DETECT)
31	4		END SENS	I	END SENSOR, TRAILER TAPE DETECT, SENS ON: L
32	3		CAP REV	O	CAP REV MODE: L
33	2		POWER ON/OFF	O	POWER CONTROL, P ON: L
34	1		SYNC DET	I	SYNC DETECT
35	0		P MUTE 2	O	PICTURE MUTE ON: H
36	Port 0 7		A MUTE	O	AUDIO MUTE ON: H
37	6		P. MUTE	O	PICTURE MUTE ON; L
38	5		REC START	O	REC START: L
39	4		REMOTE PAUSE	I	REMOTE PAUSE ON: L
40	3		SECAM	I	SECAM MODE: H
41	2		MESECAM	I	MESECAM MODE: H
42	1		NTSC 3.58	I	NTSC 3.58 MODE: H
43	0		LP SPCL	O	LP SPECIAL PLAYBACK MODE: L
44	Port 2 7	C-MOS	S/M/EX CLOCK	O	CLOCK
45	6		INDEX	I/O	INDEX (VISS) DATA WRITE/DETECT (ON: L)
46	5		SRL DATA	O	16 Bit SERIAL DATA for SERVO IC CONTROL
47	4		EXPV DATA	O	12 Bit SERIAL DATA (SERIAL/PARALLEL DATA)
48	3		NC	—	NC
49	2		EXPT DATA	O	12 Bit SERIAL DATA (SERIAL/PARALLEL DATA)
50	1		MEMORY CE	O	MEMORY IC CHIP ENABLE
51	0		MEMORY DATA	O	MEMORY IC DATA (WRITE/READ CONTROL)
52	Vcc		Vcc	I	for the SYSTEM CONTROL (DC 5.8 V)

2. IC 1 pin function (Timer)

Pin No.	Symbol	Label	I/O	Contents
1	S3	S d	O	SEGMENT DISPLAY DATA OUTPUT
2	S2	S c		
3	S1	S b		/KEY SCAN PULSE OUTPUT
4	S0	S a		/KEY SCAN PULSE OUTPUT
5	P00/INT4	POWER DOWN	I	POWER DOWN DETECT
6	P01/SCK	NC	—	NC
7	P02/SD	NC		
8	P03/SI	TEST	I	TEST POINT
9	P10/INT0	REMOTE	I	REMOCON DATA (16 bit SERIAL DATA)
10	P11/INT1	NC	—	NC
11	P12/INT2	NC		
12	P13/T10	CNT CLOCK	I	COUNTER DATA (Linear Time Counter)
13	P20	KS 0	I	KEY SCAN DATA INPUT
14	P21	KS 1		
15	P22	KS 2		
16	P23/BUZ	KS 3		
17	P30	TIMER DATA	I/O	TM (TIMER-MECHACON) bus (16 bit SERIAL DATA/CLOCK)
18	P31	TIMER CLK	O	
19	P32	NC	—	NC
20	P33	NC		
21	P60	NC		
22	P61	NC		
23	P62	NC		
24	P63	NC		
25	P40	POWER	O	LED CTL (LED ON: L)
26	P41	PAUSE		
27	P42	AUTO TRACK		
28	P43	PAL		
29	PPO	NC	—	NC
30	X1	X1	I	MAIN SYSTEM CLOCK (4.19 MHz)
31	X2	X2	O	
32	Vss	Vss	I	GND
33	XT1	XT1		
34	XT2	XT2	—	NC
35	P50	MESECAM	O	LED CTL (LED ON: L)
36	P51	SECAM		
37	P52	NTSC 3.58		
38	P53	NTSC 4.43		
39	RESET	RESET	I	RESET AT CONNECT VCR TO AC
40	T0	4G	O	COLUMN DISPLAY DATA
41	T1	5G		
42	T2	6G		
43	T3	7G		
44	T4	1G		
45	T5	2G		
46	T6	3G		
47	T7	8G		
48	T8	9G		
49	T9	10G		
50	T10/S15/PH3	S p	O	SEGMENT DISPLAY DATA
51	T11/S14/PH2	S o		/KEY SCAN PULSE OUTPUT
52	T12/S13/PH1	S n		/KEY SCAN PULSE OUTPUT
53	T13/S12/PH0	S m		/KEY SCAN PULSE OUTPUT
54	T14/S11	S l		
55	T15/S10	S k		
56	VLOAD	V LOAD	I	For the FIP DRIVER (−29.3V)
57	VPRE	V PRE		(−4.4V)
58	S9	S j	O	SEGMENT DISPLAY DATA
59	S8	S i		
60	S7	S h		/KEY SCAN PULSE OUTPUT
61	S6	S g		/KEY SCAN PULSE OUTPUT
62	S5	S f		/KEY SCAN PULSE OUTPUT
63	S4	S e		/KEY SCAN PULSE OUTPUT
64	VDD	VDD	I	for the SYSTEM CONTROL